REPORT OF THE EDUCATION COMMISSION
1964-66

Education & National Development

MINISTRY OF EDUCATION
GOVERNMENT OF INDIA

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FOREWORD

The Education Commission was appointed by the Government of India by Resolution dated 14 July 1964 to advise Government on the national pattern of education and on the general principles and policies for the development of education at all stages and in all aspects[1].

We began our task twenty-one months ago on October 2, 1964, Mahatma Gandhi's birthday. From the very beginning we have been conscious of the immensity and inherent difficulties of the task assigned to us. No task in our view could be more challenging, more vital and relevant to India's progress and development— economic, cultural and spiritual. In facing a task of such colossal magnitude and complexity, there is always a danger that the approach and recommendations may not be sufficiently radical. There is also the other possibility that the recommendations may go beyond the capacity and resources of the nation. The difficulties are greatly accentuated because educational plans are long-term plans, and long-term projections of needs and resources are beset with serious uncertainties. We hope our assumptions about the total resources of the nation over the next 20 years, and the proportion to be invested in education, are reasonable.

It cannot be gainsaid that the recommendations are inevitably circumscribed by the limits of our knowledge and experience, and by our capacity for bold, constructive and imaginative thinking. We would not claim that the recommendations made by us in the Report are necessarily the best, nor can we be completely certain about the validity of every recommendation that we have made. Again, many of the proposals we make would require investigation and revision in the light of experience. We, therefore, lay considerable emphasis on a built-in flexibility in the system of education to facilitate adjustment to changing situations and requirements. There is, of course, one thing about which we feel no doubt or hesitation: education, science-based and in coherence with Indian culture and values, can alone provide the foundation—as also the instrument—for the nation's progress, security and welfare.

Indian education needs a drastic reconstruction, almost a revolution. We need to bring about major improvement in the effectiveness of primary education; to introduce work-experience as an integral element of general education; to vocationalize secondary education; to improve the quality of teachers at all levels and to provide teachers in sufficient strength; to liquidate illiteracy: to strengthen centres of advanced study and strive to attain, in some of our universities at least, higher international standards; to lay special emphasis on the combination of teaching and research; and to pay particular attention to education and research in agriculture and allied sciences. All this calls for a determined and large-scale action. Tinkering with the existing situation, and moving forward with faltering steps and lack of faith can make things worse than before.

In view of the urgency of the situation, we felt impelled to keep the time-table originally set for the submission of the Report even if it meant some limitations on the scope of our studies and on the depth and perspicacity of our presentation. If we had more time, the Report could have been shorter and more readable.

The Commission set up twelve Task Forces on (1) School Education: (2) Higher Education; (3) Technical Education: (4) Agricultural Education: (5) Adult Education; (6) Science Education and Research; (7) Teacher Training and Teacher Status; (8) Student Welfare; (9) New Techniques and Methods; (10) Manpower; (11) Educational Administration: and (12) Educational Finance. In addition, it set up seven Working Groups on (1) Women's Education: (2) Education of Backward Classes; (3) School Buildings; (4) School Community Relations; (5) Statistics; (6) Pre-Primary Education: and (7) School Curriculum. The Task Forces and the Working Groups made a detailed study of many specific problems. Some of these studies will be published separately. The Reports of the Task Forces and the Working Groups have been of great help to us in our work and have enabled us to examine some of the important issues in a depth and detail which would not have been possible otherwise.

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[1] Legal and medical education were excluded from the purview of the Commission, but it was authorized to look into "such aspects of these problems as are necessary for its comprehensive enquiries".

We spent about one hundred days in going round all the States and some Union Territories. We visited universities, colleges and schools and held discussions with teachers, educationists, administrators and students. We convened two conferences of university students' representatives to have the advantage of personal discussion with them about student welfare and discipline. We found these conferences of real value.

We interviewed men and women distinguished in public life, scientists, industrialists and scholars in different fields and others interested in education. Altogether we interviewed about 9,000 persons. We invited written evidence, memoranda and replies to our questionnaires, organized seminars and conferences, commissioned a number of special studies and also conducted a few special enquiries such as the socio-economic background of students admitted to educational institutions, and working days in schools and colleges. The total number of memoranda and notes sent to the Commission was over 2,400.

We had the benefit of valuable consultations with a number of internationally well-known educationists and scientists. We are particularly grateful to Prof. P. M. S. Blackett, President of the Royal Society, UK; Lord Robbins, Chairman of the Committee on Higher Education (1961-63), UK; Sir Christopher Cox, Educational Adviser, Ministry of Overseas Development, UK; Sir Willis Jackson, Professor of Electrical Engineering, Imperial College of Science and Technology, Universities of London; Professor C. A. Moser, London School of Economics; Professor Frederick Seitz, President, National Academy of Sciences, USA; Dr. James E. Allen Jr., Commissioner, State Education Department and President, University of the State of New York, USA; Professor Edward Shils, University of Chicago, USA; Professor S. Dedijer, University of Lund, Sweden; Recteur J. Capelle, formerly Director-General of Education in France; Professor C. E. Beeby, Harvard University; and Academician A. D. Alexandrov, Rector, University of Leningard; and Academician O. A. Reutov, Academy of Sciences, USSR.

We had the honour and privilege of meetings with the President, the Vice-President and the Prime Minister. We had most useful discussions with the Minister for Education and some of his Cabinet colleagues and with the Deputy Chairman, Member (Education) and some other members of the Planning Commission. During our visits to the States, the Chief Ministers and Education Ministers as also their colleagues, gave us their time generously. Discussions with them were of great value and benefit to us. We had useful discussions with the Secretaries to State Governments concerned with Education, Local Government, Agriculture and Finance. We also had most useful meetings with a large number of educationists, scientists, the President of the Indian National Congress, Members of Parliament and State Legislatures, industrialists and journalists. To all of them, we are deeply grateful.

In setting up the Commission the Government of India decided to associate with it a number of distinguished educationists and scientists from other countries. Professors H. L. Elvin (UK), Jean Thomas (France), Roger Revelle (USA), S.A. Shumovsky (USSR) and Sadatoshi Ihara (Japan) served as full members of the Commission. Mr. J. F. McDougall (UNESCO Secretariat) served as Associate Secretary throughout the work of the Commission. The Indian members of the Commission would like to record their deep gratitude to the foreign members and to the Associate Secretary. It has enabled us to add considerably to our expertise and insight. While the foreign members have been fully and whole-heartedly associated with the work of the Commission and with the general trend of its conclusions, the responsibility rests primarily with the Indian members in cases where we make recommendations pertaining specifically to Indian problems.

Our Report is divided into three parts.

The first part covers Chapters I-VI. It deals with general aspects of educational reconstruction common to all stages and sectors of education. These include reorientation of the educational system to national objectives, structural reorganization, improvement of teachers, enrolment policies and equalization of educational opportunity.

The second part covers Chapters VII-XVII. It deals with the different stages and sectors of education. Chapters VII-X deal with some aspects of school education such as problems of expansion, curriculum, teaching methods, textbooks, guidance, evaluation, administration and supervision. Chapters XI-XIII deal with problems of higher education which include, amongst others, the establishment of major universities, programmes of qualitative improvement, enrolment and university governance. Chapters XIV and XV deal respectively with education for agriculture and technical and vocational education. Chapter XVI discusses programmes of science education and research. Chapter XVII deals with problems of adult education.

The third part deals with problems of implementation. It covers two chapters—Chapter XVIII which deals with educational planning and administration and Chapter XIX which deals with educational finance.

A summary of recommendations alongwith the statistical and other data is given at the end of the Report.

We realize that many of the things we say here have been said before, notably by the University Education Commission (1948-49). It is worth recalling, for instance, that the Commission laid great stress on education for agriculture and its improvement, yet nothing significant happened. The real need is *action*. The poignancy of the situation and the grim times we are passing through underscore this simple but vital fact.

We record our gratitude to the State Governments for their generous cooperation in our work through organizing our visits, making the time of busy senior officials fully available to us, readily answering all our questions, preparing memoranda on their educational progress and problems, opening their institutions to our visits and for their hospitality in making our stay in their States useful and pleasant in every way.

We thank the members of our Task Forces and Working Groups and the Secretary, UGC, for their most willing and devoted efforts to deal with complex problems in a realistic and professional manner. Theirs has been a contribution of inestimable value. We are equally grateful to all those who have given evidence, sent memoranda, replied to the questionnaires, and discussion papers and participated in seminars and conferences and given us the privilege of visiting their institutions.

We thank the agencies which carried out special studies and enquiries for us and in particular the National Council of Educational Research and Training, the Institute of Applied Manpower Research, the Indian Law Institute, the State Institutes of Education, and the several Teachers' Associations. These added background to our enquiries which we otherwise would have lacked

Many educational institutions collaborated in a number of special enquiries which the Secretariat of the Commission carried out. Many more opened their doors to our visits and provided the time and experience of their staff to our discussions. We express our gratitude to all of them.

We owe a special debt to the UGC and the Indian Institute of Public Administration who, at considerable inconvenience to themselves, provided us with the necessary accommodation.

It is a pleasure to record our thanks to the UNESCO, the British Council and the USAID for the services of members and consultants and to the Asia Foundation for a gift of books. We have to thank also the UNESCO International Institute of Educational Planning and the Governments of France, the Federal Republic of Germany and the USSR for financial and other assistance to our team which went abroad for comparative studies.

We thank our Secretariat for their selfless and devoted collaboration. A particular word of thanks goes here to the State Liaison Officers for their unstinted help.

We cannot conclude our acknowledgements without expressing our indebtedness to Shri J. P. Naik, Member-Secretary of the Commission. His unrivalled knowledge of educational problems and statistics and his indefatigable energy have been a source of unfailing strength and inspiration; and we owe more to him than to any one else that the work of the Commission could be brought to completion within the allotted time.

We are grateful to Mr. J. F. McDougall. Associate Secretary of the Commission, for his assistance at all stages of our work.

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LIST OF ABBREVIATIONS

1.	AICTE	All India Council of Technical Education
2.	CSWB	The Central Social Welfare Board
3.	ICAR	Indian Council of Agricultural Research
4.	ICCW	Indian Council of Child Welfare
5.	ICMR	Indian Council of Medical Research
6.	IUB	The Inter-University Board of India
7.	NCERT	National Council of Educational Research and Training
8.	UGC	University Grants Commission

PART ONE

GENERAL PROBLEMS

The programmes of educational reconstruction proposed in this Report fall into three broad categories :

- —internal transformation of the educational system so as to relate it to the life, needs and aspirations of the nation;
- —qualitative improvement of education so that the standards achieved are adequate, keep continually rising and, at least in a few sectors, become internationally comparable; and
- —expansion of educational facilities broadly on the basis of manpower needs and with an accent on equalization of educational opportunities.

The general aspects of these programmes have been dealt with in this part of the Report.

Chapter I deals with a few major programmes which will relate education with the life, needs and aspirations of the people.

Chapters II, III and IV deal with some general aspects of qualitative improvement. Chapter II deals with the reorganization of educational structure and some broad programmes for the improvement of standards. Chapter III deals with programmes for raising the status of teachers such as improvement in remuneration, retirement benefits, conditions of work and service, and prospects of professional advancement. Chapter IV deals with programmes of teacher education—both pre-service and in-service.

Chapters V and VI deal with problems of expansion and equalization of educational opportunities. Chapter V deals with the broad principles on which a national enrolment policy should be based during the next 20 years and the manner in which the output of the educational system can be related to manpower needs or employment opportunities. Chapter VI deals with programmes of equalization such as free education, supply of books and writing materials, scholarships, education of the handicapped children, reduction in regional imbalances in educational development, education of women, and education of the backward classes, especially of tribal people.

CHAPTER I

EDUCATION AND NATIONAL OBJECTIVES

I *Some Problems of National Development.* (5) Self-sufficiency in food; (6) Economic growth and full employment; (7) Social and national integration; (8) Political development.
II *Education: The Main Instrument of Change.* (12) Development of our human resources; (4) Education as instrument of change.
III *The Educational Revolution.* (16-17).
IV *Relating Education to Life, Needs and Aspirations of the People.* (18-20).
V *Education and Productivity.* (23) Science as a basic component of education and culture; (25) Work-experience; (32) Vocationalization; (33) Improvement of scientific and technological education and research at the university stage with special emphasis on agriculture and allied sciences.
VI *Education and Social and National Integration.* (36) The Common School; (39) Social and national service; (45) Community living in school and college; (46) Participation in programmes of community development; (49) Evolution of a language policy; (50) Development of modern Indian languages; (51) Medium of education at school and college; (57) Channels of international communication; (60) Channels of internal communication; (63) Promoting national consciousness; (67) Education for international understanding; (68) Democratic values.
VII *Education and Modernization.* (70) Explosion of knowledge; (71) Rapid social change; (72) Need for rapid advance; (73) Modernization and educational progress.
VIII *Social, Moral and Spiritual Values.* (74-77); (78) Secularism and religion.
IX *A Challenge and a Faith.* (81-87).

1.01. The destiny of India is now being shaped in her classrooms. This, we believe, is no mere rhetoric. In a world based on science and technology, it is education that determines the level of prosperity, welfare and security of the people. On the quality and number of persons coming out of our schools and colleges will depend our success in the great enterprise of national reconstruction whose principal objective is to raise the standard of living of our people. In this context, it has become urgent

- — to re-evaluate the role of education in the total programme of national development;
- — to identify the changes needed in the existing system of education if it is to play its proper role, and to prepare a programme of educational development based on them; and
- — to implement this programme with determination and vigour.

1.02. The task is neither unique nor is it quite new. But its magnitude, gravity and urgency have increased immensely and it has acquired a new meaning and importance since the attainment of independence and the adoption of the policy and techniques of planned development of the national economy. If the pace of national development is to be accelerated, there is need for a well-defined, bold and imaginative educational policy and for determined and vigorous action to vitalize, improve and expand education.

1.03. The population of India is now about 500 million, and half of it is below the age of 18 years—India today is essentially a land of youth. Over the next 20 years, the population is likely to increase by another 250 million. The total number of educational institutions in the country is over 500,000. The number of teachers exceeds 2 million The total student population which is now about 70 million will be more than doubled in the next twenty years; and by 1985, it will become about 170 million or about equal to the total population of Europe. The size and complexity of these problems argue the need for rapid action in evolving an appropriate educational policy; given this, the numbers involved constitute a rich promise for education's contribution to national development.

1.04. This Report is concerned with a synoptic appraisal of the existing educational situation in the country and presentation of an overall programme of educational development. But education cannot be considered in isolation or planned in a vacuum. It has to be used as a powerful instrument of social, economic and political change and will, therefore, have to be related to the long-term national aspirations, the programmes of national development on which the country is engaged and the difficult short-term problems it is called upon to face.

SOME PROBLEMS OF NATIONAL DEVELOPMENT

1.05. **Self-sufficiency in Food.** The first and the most important of these is food. Mahatma Gandhi said: 'If God were to appear in India, He will have to take the form of a loaf of bread'. Even at the present level of its population, the country is in short supply for food. Every five years, the increase in our population is greater than the entire population of the UK. During the next two decades, there will be an addition of about 230 million persons (or 46 per cent of the population in 1966), even on the assumption that the existing birth-rate of 40 per thousand persons is reduced to half by 1986. If it is not, this increase may be 320 million or 65 per cent of the present population.[1] On the basis of present trends, in another 10-15 years, no country is likely to have a surplus of food to export. Even if such surpluses existed, we would have no resources to import the huge quantities of food required, nor even to import the fertilizers needed. Self-sufficiency in food thus becomes, not merely a desirable goal, but a condition for survival.

1.06. **Economic Growth and Full Employment.** Allied to this is the colossal poverty of the masses and the large incidence of under-employment or unemployment among the people, particularly among the educated. India is one of the poorest countries of the world. The national income *per capita*, which was practically stationary for some decades, rose from Rs. 256.5 in 1950-51 to Rs. 348.6 in 1964-65—an increase of 2.2 per cent per year (at 1960-61 prices). Both the rate of growth as well as the level of national income are unsatisfactory. What is worse, even this income is very unevenly distributed. It has been suggested that our immediate objective should be to assure a minimum consumption of Rs. 35 per month to every citizen, sufficient to cover the balanced diet recommended by the Nutrition Advisory Committee and leave a modest allowance for other essential items (at 1960-61 prices). This, by itself, is no high standard. But at present, only the top 20 per cent of the population can afford it. The lowest 30 per cent have a monthly income of less than Rs. 15 and the lowest 10 per cent, of less than Rs. 10. If this minimum standard of Rs. 35 per month is to be reached by 1986, great efforts will have to be made on three fronts. The first is to secure a rapid rate of economic growth, at not less than 6 per cent per year and, if possible, at about 7 per cent per year. The second is to distribute income more equitably so that the more deprived sections of the population could have a comparatively larger share in the total national income. The third is to control the growth of the population so that the birth-rate is reduced at least by one-third and preferably by one-half. The least to be attempted would be to double the national income *per capita* (at constant prices) in the next twenty years. Similarly, steps will have to be taken to provide full employment to the people and especially to the educated.

1.07. **Social and National Integration.** Even more important is the role of education in achieving social and national integration. Indian society is hierarchical, stratified and deficient in vertical mobility. The social distance between the different classes, and particularly between the rich and the poor, the educated and the uneducated, is large and is tending to widen. Our people profess a number of different religions; and the picture becomes even more complicated because of caste, an undemocratic institution which is still powerful and which, strangely enough, seems to have extended its sphere of influence under the very democratic processes of the Constitution itself. The situation, complex as it was, has been made critical by recent developments which threaten both national unity and social progress. As education is not rooted in the traditions of the people, the educated persons tend to be alienated from their own culture. The growth of local, regional, linguistic and state loyalties tend to make the people forget 'India'. The old values, which held society together, have been disappearing, and as there is no effective programme to replace them by a new sense of social responsibility, innumerable signs of social disorganization are evident everywhere and are continually on the increase. These include strikes, increasing lawlessness and a disregard for public property, corruption in public life, and communal tensions and troubles. Student unrest, of which so much is written, is only one, and probably a minor one, of these symptoms. Against this background, the task to be attempted—the creation of an integrated and egalitarian society— is indeed extremely difficult and challenging.

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[1] See Paper No. 1, *Inter-relationship between Fertility and Educational Development* in Supplementary Volume I, Part V.

1.08. **Political Development.** The political challenge has many aspects, but three stand out. The first is the need to strengthen democracy. In spite of all odds, Indian democracy has given a fairly good account of itself so far. But it will not be permanently viable unless its foundations are deepened by the creation of an educated electorate, a dedicated and competent leadership and the cultivation of essential values like self-control, tolerance, mutual goodwill and consideration for others all of which make democracy, not only a form of government, but a way of life. The second is related to the defence of the country's freedom. The over-riding priority of this challenge is recognized, for one must live before one can grow. But it cannot be met only by maintaining a large and efficient army or training all able-bodied youth for military service. The defence of freedom is a national concern, to which every citizen contributes his best in order to achieve self-sufficiency in food and other essentials, to strengthen the country's economy, and to create a secular, united and strong democratic State. The third is the growing awakening among the masses who, suppressed for centuries, have now awakened to a sense of their rights and are demanding education, equality, higher standards of living and better civic amenities. This 'explosion of expectations' has also to be met through a planned programme of national development.

1.09. Internationally, the country is facing another equally significant and urgent challenge. The gap between the standards of living in India and those of industrialized nations is very large. The first scientific industrial revolution which developed in the West over the last 200 years almost passed us by. The agro-industrial revolution which is even more crucial for us has yet to begin in our country. The world is now at the beginning of the second scientific industrial revolution of automation and cybernetics which is likely to be in full swing before the close of the century. It is difficult to visualize the changes it will make in man's life. One thing, however, is certain: unless proper steps are taken right from now, the gap between us and the industrialized countries following this second revolution may become too wide to be bridged.

1.10. There is still another aspect to the challenge. It is true that knowledge is international and that there can be no barriers, except those of our own creation, to its free import. But India cannot for ever remain at the receiving end of the pipeline. She must make her own contribution as an intellectual and cultural equal to the eternal human endeavour to extend the frontiers of knowledge. This demands a large-scale programme for the discovery and development of talent and the creation of a few centres of excellence in higher education which can compare favourably with the best of their kind in the world.

1.11. The difficulty of these problems is only equalled by the complexity of the situation, the gravity and urgency of the challenge and the magnitude of the stakes involved. The Indian situation with its federal constitution (wherein several constituent States are larger than many European nations), its multi-party system of democratic government, its multi-religious mixed society consisting of highly sophisticated groups who live side by side with primitive ones, its mixed economy which includes modern factories as well as traditional agriculture, and its multiplicity of languages, presents such a complex picture that it almost resembles 'a miniature world'. In her attempts at national development the welfare of one man out of every seven in the world is at stake and the future of democracy and free societies is in balance. She is heir to an ancient and great civilization which can make a contribution to human progress by striving to create, what Acharya Vinobaji has described as the 'age of science and spirituality'. She has to raise herself from her present standards of living which are amongst the lowest in the world and take her rightful place in the comity of nations as soon as possible—a task to be accomplished within the life-time of a generation at the most. Obviously, the solution of these problems makes large demands on the Indian people of this generation—we need a clear focus, deeper understanding, collective discipline, hard and sustained work and dedicated leadership. It also needs the cooperation and assistance of richer and industrialized nations which share India's faith in democratic socialism and sympathise with her struggle to create a new social order.

EDUCATION: THE MAIN INSTRUMENT OF CHANGE

1.12. **Development of Our Human Resources.** These difficult, complex, significant and urgent problems are all interdependent and the shortest and the most effective way to their solution is obviously to make a simultaneous attack on all fronts. This will have to be attempted through two main programmes.

(1) *The development of physical resources* through the modernization of agriculture and rapid industrialization. This requires the adoption of a science-based technology, heavy capital formation and investment, and the provision of the essential infrastructure of transport, credit, marketing and other institutions: and

(2) *The development of human resources* through a properly organized programme of education.

It is the latter programme, namely, the development of human resources through education, which is the more crucial of the two. While the development of physical resources is a means to an end, that of human resources is an end in itself; and without it, even the adequate development of physical resources is not possible.

1.13. The reason for this is clear. The realization of the country's aspirations involves changes in the knowledge, skills, interests and values of the people as a whole. This is basic to every programme of social and economic betterment of which India stands in need. For instance, there can be no hope of making the country self-sufficient in food unless the farmer himself is moved out of his age-long conservatism through a science-based education, becomes interested in experimentation, and is ready to adopt techniques that increase yields. The same is true of industry. The skilled manpower needed for the relevant research and its systematic application to agriculture, industry and other sectors of life can only come from a development of scientific and technological education. Similarly, economic growth is not merely a matter of physical resources or of training skilled workers; it needs the education of the whole population in new ways of life, thought and work. Robert Heilbroner describes the journey to economic development undertaken by a traditional society as the 'great ascent' and points out that the essential condition for its success is human 'change on a grand scale'. He observes: 'The mere lay-in of a core of capital equipment, indispensable as that is for further economic expansion, does not yet catalyse a tradition-bound society into a modern one. For that catalysis to take place, nothing short of a pervasive social transformation will suffice; a wholesale metamorphosis of habits, a wrenching reorientation of values concerning time, status, money, work; and an unweaving and reweaving of the fabric of daily existence itself'.[1] These observations are applicable to advances on the social, political and cultural fronts as well.

1.14. **Education as Instrument of Change.** If this 'change on a grand scale' is to be achieved without violent revolution (and even then it would still be necessary) there is one instrument, and one instrument only, that can be used: EDUCATION. Other agencies may help, and can indeed sometimes have a more apparent impact. But the national system of education is the only instrument that can reach all the people. It is not, however, a magic wand to wave wishes into existence. It is a difficult instrument, whose effective use requires strength of will, dedicated work and sacrifice. But it is a sure and tried instrument, which has served other countries well in their struggle for development. It can, given the will and the skill, do so for India.

1.15. This emphasis on the social purposes of education, on the need to use it as a tool for the realization of national aspirations or for meeting national challenges, does not imply any under-estimation of values for the individual. In a democracy, the individual is an end in himself and the primary purpose of education is to provide him with the widest opportunity to develop his potentialities to the full. But the path to this goal lies through social reorganization and emphasis on social perspectives. In fact, one of the important principles to be emphasized in the socialistic pattern of society which the nation desires to create, is that individual fulfilment will come, not through selfish and narrow loyalties to personal or group interests, but through the dedication of all to the wider loyalties of national development in all its parameters.

THE EDUCATIONAL REVOLUTION

1.16. This direct link between education, national development and prosperity which we have emphasized and in which we deeply believe, exists only when the national system of education is properly organized, from both qualitative and quantitative points of view. The naive belief that *all* education is necessarily good, both for the individual or for society, and that it will necessarily lead to progress, can be as harmful as it is misplaced. Quantitatively, education can be organized to promote social justice or to retard it. History shows numerous instances where small social groups and elites have used education as a prerogative of their rule and as a tool for maintaining their hegemony and perpetuating the value upon which it has rested. On the other hand, a social and cultural revolution has been brought about in a system where equality of educational opportunity is provided and education is deliberately used to develop more and more potential talent and to harness it to the solution of national problems. The same is even more true of the quality of education. A system of university education which produces a high proportion of competent professional manpower is of great assistance in increasing productivity and promoting economic growth. Another sytem of higher education with the same total output but producing a large proportion of indifferently educated graduates of arts, many of whom remain unemployed or are even unemployable, could create social tensions and retard economic growth. It is only the right type of education, provided on an adequate scale, that can lead to national development; when these conditions are not satisfied, the opposite effect may result.

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[1] Robert Heilbroner, *The Great Ascent*, Harper and Row, Inc. New York, 1963, p. 65.

1.17. Judged from this point of view, it becomes evident that the present system of education, designed to meet the needs of an imperial administration within the limitations set by a feudal and traditional society, will need radical changes if it is to meet the purposes of a modernizing democratic and socialistic society—changes in objectives, in content, in teaching methods, in programmes, in the size and composition of the student body, in the selection and professional preparation of teachers, and in organization. In fact, what is needed is a revolution in education which in turn will set in motion the much desired social, economic and cultural revolution. The main concern of our Report is to identify the major programmes that can bring about this educational revolution which has three main aspects:

- internal transformation so as to relate it to the life, needs and aspirations of the nation;
- qualitative improvement so that the standards achieved are adequate, keep continually rising and, at least in a few sectors, become internationally comparable; and
- expansion of educational facilities broadly on the basis of manpower needs and with an accent on equalization of educational opportunities.

It is with the first group of the above programmes, namely, the transformation of the system to reflect the needs and aspirations of our people, that this chapter is mainly concerned.

RELATING EDUCATION TO LIFE, NEEDS AND ASPIRATIONS OF THE PEOPLE

1.18. As is well-known, the existing system of education is largely unrelated to life and there is a wide gulf between its content and purposes and the concerns of national development. For instance,

- the educational system does not reflect the supreme importance of agriculture which is neglected at all stages and does not attract an adequate share of the top talent in the country; enrolment in the agricultural faculties of universities is extremely low; and agricultural colleges are comparatively weak and under-developed;
- the main task before the nation is to secure rapid economic development. If this is to be successfully accomplished, education must be related to productivity. The present system is too academic to be of material help in increasing national wealth;
- the schools and colleges are largely unconcerned with the great national effort at reconstruction and their teachers and students generally remain uncommitted to it. They are often even unaware of its principles and very rarely have opportunities to participate in its programme;
- instead of promoting social and national integration and making an active effort to promote national consciousness, several features of the educational system promote divisive tendencies: caste loyalties are encouraged in a number of private educational institutions; the rich and the poor are segregated in schools, the former attending the better type of private schools which

charge fees while the latter are forced, by circumstances, to attend free government or local authority schools of poor quality; and

— at a time when the need to cultivate a sense of moral and social responsibilities in the rising generation is paramount, education does not emphasize character-formation and makes little or no effort to cultivate moral and spiritual values, particularly the interests, attitudes and values needed for a democratic and socialistic society.

1.19. There is hardly any need to multiply such instances—the nature of the transformation needed in our educational system is generally recognized. What we wish to emphasize is its urgency. Traditional societies which desire to modernize themselves have to transform their educational system before trying to expand it, because the greater the expansion of the traditional system of education, the more difficult and costly it becomes to change its character. This truth has been lost sight of and, during recent years, we have greatly expanded a system which continues to have essentially the same features it had at its creation about a century ago.

1.20. In our opinion, therefore, no reform is more important or more urgent than to transform education, to endeavour to relate it to the life, needs and aspirations of the people and thereby make it a powerful instrument of social, economic and cultural transformation necessary for the realization of our national goals. This can be done if education

— is related to productivity;

— strengthens social and national integration; consolidates democracy as a form of government and helps the country to adopt it as a way of life;

— hastens the process of modernization; and

— strives to build character by cultivating social, moral and spiritual values.

All these aspects are inter-related and in the complex process of social change, we cannot achieve even one without striving for all.

EDUCATION AND PRODUCTIVITY

1.21. India is in transition from a society in which education is a privilege of a small minority to one in which it could be made available to the masses of the people. The immense resources needed for this programme can be generated only if education is related to productivity so that an expansion of education leads to an increase in national income which, in its turn, may provide the means for a larger investment in education. Education and productivity can thus constitute a 'rising spiral' whose different parts sustain and support one another.

1.22. The link between education and productivity can be forged through the development of the following programmes which should receive high priority in the plans of educational reconstruction:

— science as a basic component of education and culture;

— work-experience as an integral part of general education;

— vocationalization of education, especially at the secondary school level, to meet the needs of industry, agriculture and trade; and

— improvement of scientific and technological education and research at the university stage with special emphasis on agriculture and allied sciences.

1.23. **Science as a Basic Component of Education and Culture.** A basic distinction between traditional and modern societies is the development and use by the latter of science-based technology which helps modernization of agriculture and the development of industries. In a traditional society, production is based largely on empirical processes and experience, on trial and error, rather than on science; in a modern society, it is basically rooted in science. The electrical industry was probably the first to become science-based; next came the chemical industry; and now, in industrialized countries, agriculture is fast becoming a branch of applied science. This close interlocking and interdependence between science and technology is a characteristic of the contemporary world. In recent years, several countries have been able to raise their GNP very rapidly because of their investment in basic science, technology and education. We are at a crucial stage in the process of development and transformation; and in this context the role of science (using the word in its broadest sense) is of the utmost importance. Science education must become an integral part of school education; and ultimately some study of science should become a part of all courses in the humanities and social sciences at the university stage, even as the teaching of science can be enriched by the inclusion of some elements of humanities and social sciences. The quality of science teaching has also to be raised considerably so as to achieve its proper objectives and purposes, namely, to promote an ever deepening understanding of basic principles, to develop problem-solving, analytical skills and the ability to apply them to the problems of the material environment and social living and to promote the spirit of enquiry and experimentation. Only then can a scientific outlook become part of our way of life and culture.

1.24. It is necessary to highlight this last point which is sometimes under-estimated. Science strengthens the commitment of man to free enquiry and to the quest for truth as his highest duty and obligation. It loosens the bonds of dogmatism and acts as a powerful dispeller of fear and superstition, fatalism and passive resignation. By its emphasis on reason and free enquiry, it even helps to lessen ideological tensions which often arise because of adherence to dogma and fanaticism. Although it is largely occupied with the understanding of Nature at present, its development is tending more and more to help man to understand himself and his place in the universe. In the developments that we envisage in the future, we hope that the pursuit of mere material affluence and power would be subordinated to that of higher values and the fulfilment of the individual. This concept of the mingling of 'science and spirituality' is of special significance for Indian education.

1.25. **Work-experience.** As another programme to relate education to life and productivity, we recommend that work-experience should be introduced as an integral part of all education—general or vocational. We define work-experience as participation in productive work in school, in the home, in a workshop, on a farm, in a factory or in any other productive situation. In our opinion, all good and purposeful education should consist of at least four basic elements:

- 'literacy' or a study of languages, humanities and social sciences;
- 'numeracy' or a study of mathematics and natural sciences;
- work-experience; and
- social service.

In the present educational system, most of the time is taken up with the first, although even in this limited sphere, the attainments are not appreciable. The second, as indicated above, is still quite weak and needs a great deal of emphasis. But the third and fourth have been almost totally absent till recently and need to be highlighted—the former mainly for relating education to productivity, and the latter as a means of social and national integration.

1.26. The need to include work-experience as an integral part of education is to some extent inherent in the very nature and organization of formal education. Traditionally, an individual grew up in society through participation in its activities and work-experience formed the bulk of his education. While this method had several advantages, its weakness consisted in that it was not essentially dynamic and forward-looking and tended to perpetuate traditional patterns of behaviour. Formal education, on the other hand, tended to withdraw the child temporarily from participation in community activities and to train him, in an artificial environment, for his anticipated future role in society. This created a cleavage between the world of work and the world of study. This defect is particularly conspicuous in our system of education which tends to strengthen the tradition of denigrating work and alienates the students, particularly the first generation learners, from their homes and communities. The introduction of work-experience is intended to overcome, to some extent, these weaknesses and to combine the advantage of the formal and informal systems of education.

1.27. Work-experience is thus a method of integrating education with work. This is not only possible but essential in modern societies which adopt science-based technology. In all traditional societies, an antithesis between education and work is usually postulated, partly because the techniques of production are primitive and do not necessarily require formal education, special skills or high intellectual ability, and partly because the work is generally manual, low-paid, akin to drudgery and confined mostly to the uneducated 'lower' classes. As against this, education is generally the privilege of the upper classes who are interested, not in working for a living, but in the cultivation of interests which may help them in the enjoyment of life. The educated elite thus become largely parasitical in character and the real productive workers—at a low level of efficiency generally—are the unlettered peasants and artisans. The complex techniques of production (including those in agriculture) adopted in modern societies, on the other hand, require higher forms of general or technical education and a comparatively higher level of intellectual ability. High talent is required for research in technology, and even at the lower levels of work, brain becomes more important than physical strength. The traditional resistance of educated persons to engage themselves in productive work tends to disappear because, with the adoption of the new technology, work at industry or on the farm becomes more productive and remunerative and ceases to be looked down upon socially. The educated person thus becomes an important source of production and the uneducated person, an unproductive burden on society. This process which has already started in our country needs to be accelerated and therefore the inclusion of work-experience as an integral part of all education acquires an urgent significance.

1.28. The need to provide some such corrective to the over-academic nature of formal education has been widely recognized. In the curricula of most contemporary school systems, particularly in the socialist countries of Europe, a place is found for what is variously called 'manual work' or 'work-experience.' In our country, a revolutionary experiment was launched by Mahatma Gandhi in the form of basic education. The concept of work-experience is essentially similar. It may be described as a redefinition of his educational thinking in terms of a society launched on the road to industrialization.

1.29. In addition to being an effective educational tool, work-experience can, in our view, serve some other important purposes. It can help to make the distinction between intellectual and manual work less marked as also the social stratification based on it. It could make the entry of youth into the world of work and employment easier by enabling them to adjust themselves to it. It could contribute to the increasing of national productivity both by helping students to develop insights into productive processes and the use of science, and by generating in them the habit of hard and responsible work. And it might help social and national integration by strengthening the links between the individual and the community and by creating bonds of understanding between the educated persons and the masses.

1.30. In providing work-experience, every attempt should be made to link programmes realistically to technology, industrialization and the application of science to productive processes, including agriculture. This 'forward look' in work-experience is important for a country which has embarked on a programme of industrialization. These problems will be discussed in detail elsewhere.[1]

1.31. In a well-organized programme, work-experience, at least from the higher primary stage, should also result in some earning for the student—either in cash or in kind. This would meet, to some extent, the expenditure which the students have to incur on their education or on their maintenance while at study. The amount of this earning will naturally increase as the students go up the educational ladder and it becomes possible to organize work-experience in a manner that would enable them to 'earn and learn'. The ultimate objective should be to move towards a situation in which the education of a student is not held to be complete unless he participates in some type of work-experience in real-life conditions and earns some amount, however small, towards his own maintenance. This will also help to develop in him values which promote economic growth, such as appreciating the importance of productive work and manual labour, willingness and capacity for hard work and thrift. We realize that this is no easy task But it will pay adequate dividends in the long run.

1.32. **Vocationalization.** Another programme which can bring education into closer relationship with productivity is to give a strong vocational bias to secondary education and to increase the emphasis on agricultural and technological education at the university stage. This is of special significance in the Indian situation where, as we have pointed out, the educational system has been training young persons so far mostly for government services and the so-called white-collared professions. The introduction of practical subjects in secondary schools so as to divert them into different walks of life was first recommended, as far back as in 1882, by the Indian Education Commission. But little or no effective action was taken to implement the recommendations and even today, the enrolment in the vocational courses at the secondary stage is only 9 per cent of the total enrolment, which is among the lowest in the world. Even at the university stage, vocational education (other than for law, medicine, or teaching) was mostly ignored throughout the last century. Even as late as in 1917, the Calcutta University Commission pointed out that the great majority of university students—about 22,000 out of 26,000—'pursue purely literary courses which do not fit them for any but administrative, clerical, teaching and (indirectly) legal careers'.[1] About fifty years later, we find that the overall picture has improved only slightly and the proportion of students at the university stage enrolled in all courses of professional education is only 23 per cent of the total enrolment. Our proposals on this subject are discussed elsewhere.[2] But it may be briefly stated here that we visualize the future trend of school education to be towards a fruitful mingling of general and vocational education—general education containing some elements of pre-vocational and technical education, and vocational education, in its turn, having an element of general education. In the kind of society in which we will be living increasingly in the coming years, a complete separation between the two will be not only undesirable but impossible. We also expect a considerable expansion of professional education at the university stage, especially in agricultural and technological fields.

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1.33. **Improvement of Scientific and Technological Education and Research at University Stage with Special Emphasis on Agriculture and Allied Sciences.** For the planned development of the national economy we need a large-scale expansion of enrolment in engineering and agriculture, and at the postgraduate level, in pure science subjects. The increase has to be several times the present enrolments. The quality of education and research needs a radical improvement. We propose to discuss these matters at some length in the subsequent chapters.[3]

Education and Social and National Integration

1.34. Social and national integration is crucial to the creation of a strong, united country, which is an essential pre-condition for all progress. It has a varied content—economic, social, cultural and political—and its different facets are closely interconnected. It needs

- — confidence in the nation's future;
- — a continuous rise in the standard of living for the masses and the reduction in unemployment and in the disparities in development between different parts of the country, all of which are essential to promote a sense of equality of opportunity in political, economic and social terms;
- — a deep sense of the values and obligations of citizenship and a growing identification of the people, *not* with sectional loyalties, but with the 'nation' as a whole;
- — assurance of good and impartial administration, equal treatment for every citizen, in fact and not merely in law, based on the integrity of the public services; and
- — mutual understanding and respect for the culture, traditions and ways of life of different sections of the nation.

To make this social and psychological revolution possible, it is necessary to deal with the short-term problems facing the country in this field, particularly in regard to the growing and dangerous symptoms of social disorganization. These express themselves as the widening gulf between the rich and the poor, the privileged and the unprivileged, the urban and the rural, the educated and the uneducated. They are reflected in the general weakening of the feeling of national solidarity under increasing impact of local, regional, linguistic, religious and other sectional or parochial loyalties. Effective steps must be taken to bridge these dangerous gulfs and strengthen national consciousness and unity.

1.35. Social and national integration is a major problem which will have to be tackled on several fronts including education. In our view, education can and should play a very significant role in it by

- — introducing a common school system of public education;
- — making social and national service an integral part of education at all stages;

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[1] Report of the Calcutta University Commission, Vol. I, p.21.
[2] Chapters VII, XII, XIV and XV.
[3] Chapters XIV, XV and XVI.

— developing all modern Indian languages, and taking necessary steps to enrich Hindi as quickly as possible so that it is able to function effectively as the official language of the Union; and

— promoting national consciousness.

We propose to discuss these briefly in the paragraphs that follow.

1.36. **The Common School.** In a situation of the type we have in India, it is the responsibility of the educational system to bring the different social classes and groups together and thus promote the emergence of an egalitarian and integrated society. But at present instead of doing so, education itself is tending to increase social segregation and to perpetuate and widen class distinctions. At the primary stage, the free schools to which the masses send their children are maintained by government and local authorities and are generally of poor quality. Some of the private schools are, on the whole, definitely better; but since many of them charge high fees, they are availed of only by the middle and the higher classes. At the secondary stage, a large proportion of the good schools are private but many of them also charge high fees which are normally beyond the means of any but the top ten per cent of the people, though some of the middle class parents make great sacrifices to send their children to them. There is thus segregation in education itself —the minority of private, fee-charging, better schools meeting the needs of the upper classes and the vast bulk of free, publicly maintained, but poor schools being utilized by the rest. What is worse, this segregation is increasing and tending to widen the gulf between the classes and the masses.

1.37. This is one of the major weaknesses of the existing educational system. Instead of trying to provide good education to all children, or at least to all the able children from every stratum of society, it is available to a small minority which is usually selected not on the basis of talent, but on the basis of its capacity to pay fees. The identification and development of the total national pool of ability is greatly hampered. The position is thus undemocratic and inconsistent with the ideal of an egalitarian society. The children of the masses are compelled to receive sub-standard education and, as the programme of scholarships is not very large, sometimes even the ablest among them are unable to find access to such good schools as exist, while the economically privileged parents are able to 'buy' good education for their children. This is bad not only for the children of the poor but also for the children from the rich and privileged groups. It gives them a short-term advantage in so far as it enables them to perpetuate and consolidate their position. But it must be realized that, in the long run, their self-interest lies in identifying themselves with the masses. By segregating their children, they prevent them from sharing the life and experiences of the children of the poor and coming into contact with the realities of life. In addition to weakening social cohesion, they also render the education of their own children anaemic and incomplete.

1.38. If these evils are to be eliminated and the educational system is to become a powerful instrument of national development in general, and social and national integration in particular, we must move towards the goal of a common school system of public education

— which will be open to all children irrespective of caste, creed, community, religion, economic conditions or social status;

— where access to good education will depend, not on wealth or class, but on talent;

— which will maintain adequate standards in all schools and provide at least a reasonable proportion of quality institutions;

— in which no tuition fee will be charged; and

— which would meet the needs of the average parent so that he would not ordinarily feel the need to send his children to expensive schools outside the system.

Such an educational system has for instance been built up in the USSR and is one of the major factors which has contributed to its progress. It has also been developed, in different forms and to varying extents, in other nations like the USA, France and the Scandinavian countries. The traditional English system has been different and has allowed good education, under private management, to be largely reserved for those who have the capacity to pay the necessary fees. But recently, the so-called Public Schools have come in for strong criticism in England itself and it is not unlikely that a radical change may be initiated to make them more democratic. A somewhat similar system was transplanted in India by British administrators and we have clung to it so long because it happened to be in tune with the traditional hierarchical structure of our society. Whatever its past history may be, such a system has no valid place in the new democratic and socialistic society we desire to create. We examine more fully elsewhere how this programme can be implemented.

1.39. **Social and National Service.** The present educational system, as we have mentioned earlier, is also responsible for increasing the deplorable gulf between the educated and the uneducated classes, between the intelligentsia and the masses. The intelligentsia should try to become a real service-group striving to uplift the masses and resist the temptation to become a parasitical group living for itself and perpetuating its own privileged position. Our traditional 'elite' as a whole—with some noble exceptions—had no close ties with the masses and the new 'elite' created by modern education also remained largely aloof from the people, except during the struggle for freedom under Mahatma Gandhi when he was able to inspire large numbers of educated and even well-to-do persons to identify themselves with the interests of the masses and the country as a whole. But when the struggle for freedom came to an end with the attainment of independence, they have again tended to move away from the people. This is a great danger and with a view to meeting it, suitable programmes to help in the evolution of a well-knit and united nation have to be devised.

1.40. For this purpose, we recommend that some form of social and national service should be made obligatory for all students and should form an integral part of[1] education at all stages. This can become an instrument to build character, improve discipline, inculcate a faith in the dignity of manual labour and develop a sense of social responsibility.

1.41. Programmes of social and national service can be organized in one of two ways: they can either be carried out occasionally on a part-time basis during the period of education, or organized as a period of full-time service in addition to the present period of education. The second approach was recommended by the National Service Committee appointed under the chairmanship of Dr. C. D. Deshmukh. It was suggested that national service should be a full-time programme of nine to twelve months for all young persons (except for those allowed deferment on valid academic or other grounds) passing out of higher secondary schools or the pre-university course, and before entering employment or the university. The programme was to include some military training, social service, manual labour and general education. These proposals have not been adopted so far; nor have the public reactions to them been very favourable. Instead, at the time of the national emergency (1962), the scheme of compulsory National Cadet Corps (NCC) was introduced at the university stage.

1.42. About the same time, the Ministry of Education sponsored a study of national service in several countries including Yugoslavia, Czechoslovakia, Germany, Norway, Sweden, England, the USA, Japan and the Phillipines. The report of this study has been published under the title *National Service for Youth.* Apart from discussing the salient features of such service in different countries, it made a number of recommendations about what could be done in India to develop a practicable scheme. It did not favour the introduction of compulsion, which has not been tried or favoured in any of these countries, but recommended that national or social service should be introduced, at least to begin with, on a voluntary basis and extended as widely as possible and that it should provide a rich and varied programme of activities which will make an imaginative approach to youth. We believe that it would be more realistic and practicable to introduce the idea of social or national service broadly on the lines recommended in this study.

1.43. Instead of adding one year to the total span of education for the purpose, a more feasible plan may be to develop, as an integral part of education, a programme which would run concurrently with academic studies in school and college. The programme should begin from the upper primary stage and continue up to the university so that the right attitudes are developed from an early age and every young person is ultimately brought within its ambit.

1.44. There are two main forms in which such service can be organized:

- encouraging and enabling students to participate in community living on the school or college campus; and

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— providing opportunities of participation in programmes of community development and national service.

1.45. **Community Living in School and College.** Every educational institution should try to develop a rich community life of its own and provide adequate and satisfying opportunities for students to participate in it and help in organizing it. Various opportunities for such work exist in the classroom, on the campus of the schools and the colleges, in the hostel and on the playgrounds. For instance, instead of utilizing servants and hired labour for educational institutions and their hostels, it is possible to have much of the work done by students, not primarily to save money, but to provide valuable experience. Japan has followed this practice in her national system and many schools in India (including some schools for well-to-do children) are also doing so to some extent. This type of work-experience would cultivate in students habits of work and a sense of the dignity of labour. If this is done on a nation-wide scale, it will incidentally effect some saving in expenditure which could be utilized for providing certain basic amenities for students. The training institutions for basic teachers have tried to develop such traditions of community living by eliminating the use of servants to a large extent. We recommend that this pattern of hostel life should be introduced in all schools and colleges so far as possible. The practice of making self-help and manual work a part of the daily life and training in all types of educational institutions—as was the case in many of the old Ashrams and Academies—would yield good educational results. We cannot totally recreate the conditions of the past in our educational institutions: but we can certainly profit from the useful elements in past experience.

1.46. **Participation in Programmes of Community Development.** In addition to these institutional programmes, it is essential to make participation in meaningful programmes of community service an integral part of all education from the primary to the undergraduate stage. Such participation can help to create positive attitudes towards social service and develop closer ties between the educated persons and the rest of the people. It can also help in building up a sense of social purpose and self-confidence and give students a sense of participation in community life and activities.

1.47. The organization of the programmes will naturally vary from stage to stage:

(1) At the primary stage, it will take the form of bringing the school closer to the community with an accent on serving the community in suitable ways.

(2) At the secondary stage, such programmes can be more ambitiously designed and have a greater impact on young minds. Every secondary school should develop carefully planned programmes for promoting good school-community relations and suitable forms of service to the community. We recommend that about *ten* days a *year* (or a total of 30 days at the lower secondary stage and 20 days at the higher secondary stage) may be fully devoted to such programmes. Where this is not possible, it should be obligatory on the students to participate in the Labour Service Camps for secondary school students to be organized by the State Education Departments on a district basis. The programme is discussed more fully elsewhere.

(3) Similarly, it should be obligatory on every college student, before he is awarded his first degree, to put in at least 60 days of national service in one to three stretches. Each college should develop its own appropriate programme suited to its objectives, its resources and the age and competence of its students. Participation in Labour and Social Welfare Camps or the NCC should also be regarded as alternative forms of such service.

1.48. The NCC programme, which has been made compulsory at the university stage during the last three years has shown some good results. It has possibilities of promoting national development by building up closer ties between the people and the defence services. It also helps to lessen the difference between the so-called 'martial' and other classes and inculcates the idea of the defence of freedom amongst all classes of people. As it has been started comparatively recently, we think—and the NCC authorities have also pressed this

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point—that it should be continued on its present basis for some time longer, say, till the end of the fourth five year plan. We would, however, recommend to the authorities concerned to explore the possibility of organizing this training, *not* throughout the period of three years as at present, but in a concentrated and whole-time programme spread over about 60 days which, as stated earlier, could be completed by students in one to three stretches according to their convenience. As alternative forms of social service come into being, NCC should be made voluntary, leaving the students free to opt for it or any other form of social service provided.

1.49. **Evolution of a Language Policy.** The development of a proper language policy can also assist materially in social and national integration. Of the many problems which the country has faced since independence, the language question has been one of the most complex and intractable and it still continues to be so. Its early and satisfactory solution is imperative for a variety of reasons, educational, cultural and political.

1.50. **Development of Modern Indian Languages.** It is hardly necessary to emphasize that the development of the Indian languages is both urgent and essential for the development of the Indian people and as a way of bringing together the elite and the masses. It can make scientific and technical knowledge more easily accessible to people in their own languages and thus help not only in the progress of industrialization but also in the wider dissemination of science and the scientific outlook. Energetic action is needed to produce books and literature, particularly scientific and technical, in the regional languages. This should be regarded as a specific and imperative responsibility of the universities: and the UGC should provide general guidance and allot adequate funds for the programme.

1.51. **Medium of Education at School and College.** The development of the modern Indian languages is inextricably linked with the place given to them in the educational system, specially at the university stage. The medium selected should enable students to acquire knowledge with facility, to express themselves with clarity and to think with precision and vigour. From this point of view, the claims of the mother-tongue are pre-eminent. About thirty years ago, delivering the convocation address of the Calcutta University, Rabindra Nath Tagore had expressed his views in this matter in no uncertain terms:

> In no country in the world, except India, is to be seen this divorce of the language of education from the language of the pupil. Full hundred years have not elapsed since Japan took its initiation into Western culture. At the outset she had to take recourse to textbooks written in foreign languages, but from the very first, her objective had been to arrive at the stage of ranging freely over the subjects of study in the language of the country. It was because Japan had recognized the need of such studies, not as an ornament for a select section of her citizens, but for giving power and culture to all of them, that she deemed it to be of prime importance to make them universally available to her people. And in this effort of Japan to gain proficiency in the Western arts and sciences, which were to give her the means of self-defence against the predatory cupidity of foreign powers, to qualify her to take an honoured place in the comity of nations, no trouble or expense was spared. Least of all was there the miserly folly of keeping such learning out of easy reach, within the confines of a foreign language.

Learning through a foreign medium compels the students to concentrate on cramming instead of mastering the subject matter. Moreover, as a matter of sound educational policy, the medium of education in school and higher education should generally be the same. Prior to 1937, the position was at least consistent. English was the medium both in the upper stages of school and in college education. As we have rightly adopted the regional languages as the media of education at the school stage, it follows that we should adopt them increasingly at the higher stage also.

1.52. This proposal has also been supported strongly as a measure to promote social and national integration. The Emotional Integration Committee was of the view that the use of regional languages as media of education from the lowest to the highest stage of education was a matter of 'profound importance for national integration'. This was supported by the National Integration Council (June 1962) which said: 'The change in the medium of instruction is justified not so much by cultural or political sentiments as on the very important academic consideration of facilitating grasp and understanding of the subject-matter. Further, India's university men will be unable to make their maximum possible contribution to the advancement of learning generally, and science and technology in particular, unless there is a continuous means of communication in the shape of the regional languages between its masses, its artisans and technicians and its university men The development of the talent latent in the country will also, in the view of the Council, be retarded unless regional languages are employed as media of instruction at the university stage'. We generally agree with these observations.

1.53. It has been sometimes argued that there should be a single medium of education at the university stage—English for the time being, to be ultimately substituted by Hindi—on the ground that it would promote mobility of teachers and students from one part of the country to another, provide for easy communication between academic and professional men and administrators, further intellectual cooperation amongst the universities and help in other ways in developing a corporate intellectual life in the country. We are inclined to think, on a balance of considerations, that this solution is not feasible. In practice, it will probably mean the indefinite continuance of English as the only medium of education in higher education, a development that we cannot support in the larger interests of the country. The adoption of Hindi as a common medium of education in all parts of India is not possible for some years to come and, in non-Hindi areas, it will still have some of the disadvantages associated with the use of a foreign medium and is likely to be resisted. It would, therefore, be unwise to strive to reverse the present trend for the adoption of the regional languages as media of education at the university stage and to insist on the use of a common medium in higher education throughout the country

1.54. To sum up:

(1) We are convinced of the advantages of education through the regional languages. We regard the development of regional languages as vital to the general progress of the country, and as an important step towards the improvement of quality in education. To avoid any misunderstanding we would emphasize that this does not mean the shutting out of English, or other world languages. In fact we will profit from these languages all the more when our education becomes more effective and useful.

(2) In view of the importance of the problem, we suggest that the UGC and the universities carefully work out a feasible programme suitable for each university or group of universities. The change-over should take place as early as possible and, in any case, within about ten years, since the problem will only become more complex and difficult with the passage of time. A large programme of producing the needed literature in the Indian languages will have to be undertaken; and adequate arrangements will have to be made for the training and retraining of teachers.

(3) What is required is to formulate a clear policy, to express it in unambiguous terms, and to follow it up with firm, bold and imaginative action. We should avoid a policy of drift which will only be harmful. Nor should we get involved in the vicious circle of 'no production because no demand' and 'no demand because no production'.

(4) We recognize that suitable safeguards would have to be devised, in the transitional stage, to prevent any lowering of standards during the process of change-over because of inadequate preparation. In fact the desirability and success of the change should be judged in terms of the contribution it makes to raising the quality of education. But caution should not be equated to delay or procrastination. It is meaningful only if it is part of a policy of determined, deliberate and vigorous action.

1.55. There will, however, be one important exception to this general rule, namely, all-India institutions which admit, in considerable numbers, students from different parts of the country. These now use English as the medium of education, which should continue undisturbed for the time being. A change-over to Hindi may be considered in due course provided two conditions are fulfilled. The first is the effective development of Hindi as a medium of education at this level. This is a matter which can be left to the UGC and the institutions concerned to decide. The second is the equally important political consideration that, in such a change-over, the chances of students from non-Hindi areas should not be adversely affected and that the proposal should have the support of the non-Hindi States. The latter principle has been already conceded by the Government of India even in the larger sphere of the use of Hindi in official communications between the States and the Centre.

1.56. Simultaneously, it is necessary to make the regional languages the official languages of the regions concerned as early as possible so that higher services are not *de facto* barred to those who study in the regional medium. The acceptance of the regional languages as media at the university is much more likely when good employment which now depends largely on a knowledge of English and is more easily open to students who have studied through English, becomes available to those who have studied through the regional medium. We might also add here that, though Urdu is not a regional language in the ordinary sense of the word, it has an all-India significance since it is spoken by certain sections of the people in different parts of the country. Due encouragement must be given to it at all stages not only because of this peculiar character but also because of its close links with the official language, Hindi.

1.57. **Channels of International Communication.** The introduction of the regional languages as media of education should not be interpreted to mean underrating the importance of English in the university. For a successful completion of the first degree course, a student should possess an adequate command over English, be able to express himself in it with reasonable ease and felicity, understand lectures in it and avail himself of its literature. Therefore, adequate emphasis will have to be laid on its study as a language right from the school stage. English should be the most useful 'library language' in higher education and our most significant window on the world. It is also important to encourage the study of other foreign languages on a more extensive scale for a variety of academic and practical purposes. Russian has a special significance for the study of science and technology in the present day world.[1] In addition, French, German, Japanese, Spanish and Chinese are important world languages of communication and for acquiring knowledge and culture. We recommend that all universities, some selected colleges, and also a small proportion of carefully selected schools should provide for the teaching of these languages. The knowledge of another foreign language (especially Russian) besides English should be a requirement for a doctorate degree, and in certain subjects, even for the Master's degree.

1.58. The country will need, in increasing numbers, a small but extremely proficient group of persons in important foreign languages and their literature. From this point of view, it would be necessary to establish a few schools which will begin teaching, right from an early age, important foreign languages referred to above and use them also as media of education. The admission to these schools should be on a selective basis and there should be an adequate provision of scholarships.

1.59. It would be an important step towards the general development of higher education, and also towards international co-operation and understanding, if there were established a small number of institutions, at university level, with some of the important 'world languages' as media of education. A beginning has already been made with the Institute of Russian Studies at New Delhi. It would be desirable to set up, during the fourth plan, institutions on somewhat similar lines in German, French, Spanish and Japanese languages. We could also establish one or two more institutions in Russian. The institutions will have to be largely residential. It will be an advantage to have them as constituent units of universities in their neighbourhood.

1.60. **Channels of Internal Communication.** Hindi (or any other Indian language for that matter) must be greatly developed and enriched before it can attain the status of a library language, that is, a language which can serve as a vehicle for acquiring a substantial part of the current and rapidly expanding stock of world knowledge. This has to be taken into account fully in determining our language policy. This implies, as stated earlier, that every graduate will need to acquire a reasonable proficiency in a library language, which will be English for most students. It will thus serve as a link-language in higher education for academic work and intellectual inter-communication.

1.61. It is, however, equally obvious that English cannot serve as the link-language for the majority of our people. It is only Hindi which can and should take this place in due course. As it is the official language of the Union and the link-language of the people, all measures should be adopted to spread it in the non-Hindi areas. The success of this programme will largely depend on the extent to which it is voluntarily accepted by the people of these areas. We were interested to know that in the Kerala University, where students can take Hindi in place of Malayalam at the undergraduate stage, a larger proportion of students choose to study Hindi. We have also seen increasing evidence on the part of non-Hindi areas to take to the study of Hindi. All their efforts in this matter, particularly in the non-official sector, should receive encouragement.

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[1] It is interesting to note that the number of students studying Russian in the UK is larger than that of the students studying Russian in India.

1.62. In addition to Hindi, it is essential to provide multiple channels of inter-State Communication in all modern Indian languages. In every linguistic region, there should be a number of persons who know all the other modern Indian languages and some who are familiar with their literatures and able to contribute to them. For this purpose, we recommend that there should be adequate arrangements, both in schools and colleges, for teaching different modern Indian languages. In addition, steps should be taken to establish strong departments in some of the modern Indian languages in every university. It may also be advisable to create a small number of special institutes (or advanced centres) for the comparative study of different languages and their linguistic problems. At the B.A. and M.A. levels, it should be possible to combine two modern Indian languages. This will incidentally supply the bilingual persons needed for language teaching in schools and colleges.

1.63. **Promoting National Consciousness.** India is a land of diversities—of different castes, peoples, communities, languages, religions and cultures. What role can the schools and universities play in enabling their students to discover the 'unity in diversity' that India essentially is, and in fostering a sense of national solidarity transcending narrower loyalties?

1.64. Unfortunately, our school system as a whole has had no strong tradition of striving to develop a sense of national unity and national consciousness. Under the British administration, the schools were expected to teach loyalty to the British rule rather than instil love for the motherland. Consequently, the effort to develop national consciousness was made largely outside the educational system, particularly during the struggle for freedom which developed between 1900 and 1947. Its foundation was a renewed belief in the value of national culture and traditions and a pride in India's past achievements. It recognized that, in the cultural exchange between India and the West, India also had something worthwhile to give in return for the gift of modern science and technology; and that Indians should strive to maintain the valuable elements in their own traditional culture while accepting all that is good in the West. This was not meant as an attempt at revivalism, though it was certainly so interpreted by some sections. It was an attempt, as Gandhiji put it, to refuse to be blown off one's feet even when all the windows of one's house were thrown open to fresh winds from every corner of the world.

1.65. With the attainment of independence, the situation has changed greatly. The one rallying point which had kept many diverse elements together ceased to exist, and as the schools were unable to inculcate and strengthen national consciousness, the sentiment itself seems to be wearing thin, particularly in the new generation now coming of age. We saw something similar to the old spirit reviving in recent years—in the wake of the Chinese invasion of 1962 and during the recent conflict with Pakistan. Obviously, such unfortunate international conflicts cannot be considered the normal ways to awaken and strengthen the national spirit. The only enduring solution to the problem is to place this responsibility on the educational system and to make it an effective instrument for the purpose. There is much evidence in the world to show that schools and universities can play a major and helpful part in the regeneration and advancement of a people and in generating the psychological energy needed for the purpose. If rightly oriented, this approach is not, and should not be incompatible with the wider loyalties to mankind as a whole which we have also emphasized.

1.66. The deepening of national consciousness can be fostered specially by two programmes: (1) the understanding and re-evaluation of our cultural heritage, and (2) the creation of a strong driving faith in the future towards which we aspire. The first would be promoted by well-organized teaching of the languages and literatures, philosophy, religions and history of India, and by introducing the students to Indian architecture, sculpture, painting, music, dance and drama. In addition, it would be desirable to promote greater knowledge, understanding and appreciation of the different parts of India by including their study in the curricula, by the exchange of teachers wherever possible, by the development of fraternal relations between educational institutions in different parts of the country, and the organization of holiday camps and summer schools on an inter-

State basis designed to break down regional or linguistic barriers. It would further be necessary to establish and maintain all-India institutions which will admit students from different parts of the country. Faith in the future would involve an attempt, as a part of the course in citizenship, to bring home to the students the principles of the Constitution, the great human values referred to in its preamble, the nature of the democratic and socialistic society which we desire to create and the five year plans of national development. At the higher stages of education the students should learn to assess the value of modern movements and tendencies so that they may learn which of them can and should be usefully assimilated into our culture. We should, however, take care to avoid identifying all 'modern' with 'western' values.

1.67. **Education for International Understanding**. There is no essential contradiction, as we have pointed out earlier, between this objective and the development of International understanding for the 'one-world' towards which we are moving. On the whole, textbooks used in national school systems perhaps contain fewer untrue or hostile remarks about other countries than they did in the past, thanks partly to the work of UNESCO, under whose auspices multi-national and bi-national efforts have been made for their revision. The sins are more often now of omission than of active commission. We should, however, guard ourselves against this also, for ignorance is often not less dangerous than hostility. Our studies in the humanities and social sciences should be so oriented that, while helping students to become good and active citizens of their own country, they will also enable them to acquire a knowledge and understanding of the essential features of the outside world, particularly of our neighbouring and Afro-Asian countries. Indian culture has had a strong and honourable tradition of international understanding, of valuing, on the whole with an open mind, the contributions of different countries and races to human civilization. For this purpose, the fact that she is a country with many communities but of one common citizenship should actually prove to be an advantage. The constitution of UNESCO speaks of 'the fruitful diversity of the cultures of mankind'. If through the schools and universities, a person learns to appreciate the basic rightness of that phrase in his own federal and multi-community country, he is less likely to forget it on the international plane where he deals with persons belonging to different nations but enjoying equal membership in the community of mankind. The programme of social and national integration which will minimize the internal barriers and suspicions which exist today will not only be a national gain, but may even make an impact on international relations and international situation as a whole. This was one of the great inspirations of Jawaharlal Nehru's policy.

1.68. **Democratic Values.** In this context, special emphasis has to be laid on the development of values such as a scientific temper of mind, tolerance, respect for the culture of other national groups, etc., which will enable us to adopt democracy, not only as a form of government, but also as a way of life. As stated earlier, the population of India consists of persons who profess differrent religions, speak different languages, belong to different races, castes, classes and communities. It is precisely in such a situation that democracy can make its most significant contribution. A healthy development of democratic trends will help to soften the impact of this division into social, economic and cultural groups. The task is admittedly difficult; but it can convert the differences of language, cultural pattern, religion, etc., into the warp and woof of a very rich and rewarding social and cultural life. The problem of national integration is essentially one of harmonizing such differences, of enabling different elements of the population to live peacefully and cooperatively and to utilize their varied gifts for the enrichment of the national life as a whole. We have to cultivate a spirit of large-hearted tolerance, of mutual give and take, of the appreciation of ways in which people differ from one another. This is a very exacting 'experiment in living' that we have launched and no education will be worthwhile if the educated mind is unable to respond to this situation with intelligence and imagination.

EDUCATION AND MODERNIZATION

1.69. We have already stated that the most distinctive feature of a modern society, in contrast with a traditional one, is in its adoption of a science-based technology. It is this which has helped such societies to increase their production so spectacularly. It may be pointed out, however, that science-based technology has other important implications for social and cultural life and it involves fundamental social and cultural changes which are broadly described as 'modernization'. We shall briefly discuss the impact of this modernization on programmes of educational reconstruction.

1.70. **The Explosion of Knowledge.** There has been a great explosion of knowledge during the last few decades. In a traditional society, the stock of knowledge is limited and grows slowly so that the main aim of education is interpreted to be its preservation. In a modern society, on the other hand, the stock of knowledge is far greater and the pace of its growth is infinitely quicker. One of the main tasks of education in a modern society, is to keep pace with this advance in knowledge. In such a society, knowledge inevitably ceases to be something to be received passively; it is something to be actively discovered. If this is rightly understood, it would involve a revolution in traditional education where 'to know' has come to mean 'to know by heart', where respect for all inherited knowledge is assiduously cultivated and where the assimilative faculties tend to be emphasized to the neglect of the critical and creative ones. In India, as in other countries where similar conditions prevail, this would require, among other things, a new approach to the objectives and methods of education and changes in the training of teachers. Unless they are trained in new ways of teaching and learning, the students in schools and colleges will not be able to receive the type of education needed for the new society.

1.71. **Rapid Social Change.** Another feature of a modern society is the quick, almost breath-taking rate at which social change takes place. In a traditional society, change is so slow that the conservatism of the educational system does comparatively little harm. In a modern society, on the other hand, change is so rapid that the school must always be alert if it is to keep abreast of significant changes. There is, therefore, an imperative need for adopting a dynamic policy in such a situation. An educational system which does not continually renovate itself, becomes out of date and hampers progress because it tends to create a lag between its operative purposes and standards and the new imperatives of development, both in quality and quantity. The very aim of education has to be viewed differently—it is no longer taken as concerned primarily with the imparting of knowledge or the preparation of a finished product, but with the awakening of curiosity, the development of proper interests, attitudes and values and the building up of such essential skills as independent study and the capacity to think and judge for oneself without which it is not possible to become a responsible member of a democratic society.

1.72. **Need for Rapid Advance.** Two other aspects of modernization need emphasis. The first is that once a society launches itself upon a programme of modernization, there is no turning back, no half-way house where we can arrest the process. In the initial stages, such a change must disturb the traditional equilibrium reached and maintained over centuries which, though it had its obvious disadvantages, had some built-in redeeming factors as well. The attempt to create a new social order naturally creates a host of unexpected social, economic, cultural and political problems. But if one tinkers with the problems involved or tries to march with faltering steps, if one's commitments and convictions are half-hearted and faith is lacking, the new situation may turn out to be worse than the old one. The only solution to these transitional problems is to move rapidly forward and create a new equilibrium, based on the full implications of the process of modernization.

1.73. **Modernization and Educational Progress.** The progress of modernization will, therefore, be directly related to the pace of educational advance and the one sure way to modernize quickly is to spread education, to produce educated and skilled citizens and train an adequate and competent intelligentsia. The Indian society of today is heir to a great culture. Unfortunately, however, it is not an adequately educated society, and unless it becomes one, it will not be able to modernize itself and to respond appropriately to the new challenges of national reconstruction or take its rightful place in the comity of nations. The proportion of persons who have so far been able to receive secondary and higher education is very small at present—less than two per cent of the entire population. This will have to be increased to at least ten per cent to make any significant impact. The composition of the intelligentsia must also be changed; it should consist of able persons, both men and women, drawn from *all* strata of society. There must also be changes in the skills and fields of specialization to be cultivated. At present, it consists predominantly of the white-collared professions and students of humanities, while the proportion of scientists and technical workers in its ranks is quite small. To achieve this, greater emphasis must be placed, as we have argued earlier, on vocational subjects, science education and research. Its average level of competence is not at all satisfactory, due mainly to inadequate standards maintained in the universities. This is damaging to Indian academic life and its reputation. In order to change this situation radically, it will be necessary to establish a few 'major' universities in the country which attain standards comparable to the best in any part of the world, and which will gradually spread their influence to others. This is one of the basic reforms needed in our system of higher education[1].

SOCIAL, MORAL AND SPIRITUAL VALUES

1.74. Modernization does not mean—least of all in our national situation—a refusal to recognize the importance of or to inculcate necessary moral and spiritual values and self-discipline. Modernization, if it is to be a living force, must derive its strength from the strength of the spirit. Modernization aims, amongst other things, at creating an economy of plenty which will offer to every individual a larger way of life and a wider variety of choices. While this freedom to choose has its own advantages, it also means that the future of society will depend increasingly upon the type of choice each individual makes. This would naturally depend upon his motivation and sense of values, for he might make the choice either with reference entirely to his own personal satisfaction or in a spirit of service to the community and to further the common good. The expanding knowledge and the growing power which it places at the disposal of modern society must, therefore, be combined with the strengthening and deepening of the sense of social responsibility and a keener appreciation of moral and spiritual values. While a combination of ignorance with goodness may be futile, that of knowledge with a lack of essential values may be dangerous. The weakening of social and moral values in the younger generation is creating many serious social and ethical conflicts in western societies and there is already a desire among some great western thinkers to balance the knowledge and skills which science and technology bring with the values and insights associated with ethics and religion at its best, *viz.*, a search for the knowledge of the self, of the meaning of life, of the relationship of man to other human beings and to the ultimate reality. In the situation that is developing it is equally important for us to give a proper value-orientation to our educational system.

1.75. It is not our purpose to enumerate a list of values to be inculcated. What we would like to emphasize is the need to pay attention to the inculcation of right values in the students at all stages of education. We are happy to note that an awareness of this responsibility has been growing since independence. The University Education Commission (1948) considered both its philosophical and practical aspects and made certain valuable proposals for reform. However, except in a small number of institutions, they were not implemented. In 1959 the Central Advisory Board of Education appointed a special committee on Religious and Moral Instruction (the Sri Prakasa Committee). The Report of this Committee has been before the country for five years, but response from educational institutions has been neither active nor enthusiastic. This is having a very undesirable effect on the character of the rising generation. It has, therefore, become necessary and urgent to adopt active measures to give a value-orientation to education. From this point of view, we make the following recommendations:

(1) The Central and State Governments should adopt measures to introduce education in moral, social and spiritual values in all institutions under their direct control on the lines recommended by the University Education Commission on religious and moral instruction.

(2) The privately managed institutions should also be expected to follow suit.

(3) Apart from education in such values being made an integral part of school programmes generally, some periods should be set apart in the time-table for this purpose. They should be taken, not by specially recruited teachers but by general teachers, preferably from different communities, considered suitable for the purpose. It should be one of

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[1] See Chapter XI for details.

the important objectives of training institutions to prepare them for it.

(4) We also suggest that the University Departments in Comparative Religion should be specially concerned with the ways in which these values can be taught wisely and effectively and should undertake preparation of special literature for use by students and teachers.

1.76. Our proposals for such instruction at the school stage are discussed elsewhere[1]. For higher education, we agree with the suggestions made by the University Education Commission and the Sri Prakasa Committee. A general study of the different religions of the world should be a part of the first degree courses and a graded syllabus should be prepared for the purpose. For instance, in the first year, it can deal with the lives of great religious leaders; in the second, selections from the scriptures of the world with a universal appeal could be studied; and in the third year, the central problems of the philosophy of religions considered. We would also like to lay stress on the importance of encouraging students to meet in groups for silent meditation.

1.77. In the attempt to inculcate values through education, we should draw freely upon our own traditions as well as the traditions of other countries and cultures of the world. There are strands within Indian thought itself which can lead to the new outlook appropriate for a modern society and which can prepare the people for a willing acceptance of life with all its joys and sorrows, its challenges and triumphs. In them, too, we can find inspiration for social service and faith in the future. Mahatma Gandhi, for instance—and some other great leaders of thought—discovered the inspiration for their idealism and their passionate striving for social justice and social reconstruction largely from these sources. It is such re-interpretations and re-evaluations of the past that are now most needed. It is, however, specially important in the world of today that this effort should not be restricted to the national sources only. It would be necessary to draw upon liberalising forces that have arisen in the western nations and which have emphasized, among other things, the dignity of the individual, equality and social justice, *e.g.*, the French Revolution, the concept of the welfare state, the philosophy of Marx and the rise of socialism. A major weakness of the Indian, and particularly of the Hindu society, in the past, has been a lack of equality and social justice. These balancing influences have, therefore, a great significance. Similar assimilations of whatever is significant should also be discriminatingly made from other important nations and cultures such as Chinese, Japanese or Islamic.

1.78. **Secularism and Religion.** In a multi-religious society like ours, it is necessary to define the attitude of the State to religion, religious education and the concept of secularism. The adoption of a secularist policy means that in political, economic and social matters, all citizens, irrespective of their religious faith, will enjoy equality of rights, that no religious community will be favoured or discriminated against, and the instruction in religious dogmas will not be provided in State schools. But it is *not* an irreligious or anti-religious policy; it does *not* belittle the importance of religion as such. It gives to every citizen the fullest freedom of religious beliefs and worship. It is anxious to ensure good relations amongst different religious groups and to promote not only religious tolerance but also an active reverence for all religions.

1.79. In such a society, however, one has to make a distinction between 'religious education' and 'education about religions'. The former is largely concerned with the teaching of the tenets and practices of a particular religion, generally in the form in which the religious group envisages them, whereas the latter is a study of religions and religious thought from a broad point of view—the eternal quest of the spirit. It would not be practicable for a secular State with many religions to provide education in any one religion. It is, however, necessary for a multi-religious democratic State to promote a tolerant study of all religions so that its citizens can understand each other better and live amicably together. It must be remembered that, owing to the ban placed on religious instruction in schools and the weakening of the home influences which, in the past, often provided such instruction, children are now growing up without any clear ideas of their own religion and no chance of learning about others. In fact, the general ignorance and misunderstanding in these matters are so widespread in the younger generation as to be fraught with great danger for the development of a democracy in which tolerance is rated as a high value. We suggest that a syllabus giving well-chosen information about each of the major religions should be included as a part of the course in citizenship or as part of general education to be introduced in schools and colleges up to the first degree. It should highlight the fundamental similarities in the great religions of the world and the emphasis they place on the cultivation of certain broadly comparable and moral and spiritual values. It would be a great advantage to have a common course on this subject in all parts of the country and common textbooks which should be prepared at the national level by competent and suitable experts available on each religion. When these courses have been prepared, it would be worthwhile to have them scrutinized by a small committee of eminent persons belonging to different religions to ensure that nothing is included in them to which any religious group could take legitimate objection.

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[1] Chapter VIII.

1.80. A vitalized study of science with its emphasis on open-mindedness, tolerance and objectivity would inevitably lead to the development of a more secular outlook, in the sense in which we use the word, amongst those who profess different religions. This process needs to be carefully and wisely encouraged. Simultaneously, there is a sense in which the walls between the secular and the spiritual are tending to break down and what is secular is seen to have spiritual roots. In the words of Dr. Iqbal, 'the spirit finds its opportunity in the material, the natural and the secular. All that is secular is, therefore, sacred in the roots of its being'. This is what we envisage as the direction of our future development. We believe that India should strive to bring science and the values of the spirit together and in harmony, and thereby pave the way for the eventual emergence of a society which would cater to the needs of the whole man and not only to a particular fragment of his personality.

A CHALLENGE AND A FAITH

1.81. India is on the move again—with the promise of a new renaissance in the making. After a long period of foreign rule she has emerged into freedom. That her means for the winning of freedom, adopted under Gandhi and Nehru, were as noble as the ends, is a signpost of profound historical significance.

1.82. Politically the land is free, but economically she has a long way to go. The elimination of ignorance and of grinding poverty accumulated over centuries of inertia and exploitation is not an easy task. India today has half of the total illiterate population of the world. About fifty million of per people, a tenth of the total population, live on an yearly income of no more than Rs. 120. The problems are grave and immense. But, this is only one side of the picture. During recent years, great strides have been taken towards industrialization, towards modernization of agriculture, and to provide better health and life to the people.

1.83. The most powerful tool in the process of modernization is education based on science and technology. The one great lesson of the present age of science is that, with determination and willingness to put in hard work, prosperity is within the reach of any nation which has a stable and progressive government. There is no doubt that in the years to come India's trade and commerce will grow: there will be more food for all; more education, better health and a reasonable standard of living will be available. But, India's contribution can, and should be far more than these material gains. She should learn to harness science but she must also learn not to be dominated by science. In this respect India has a unique advantage with her great tradition of duty without self-involvement (अनासक्ति), unacquisitive temperament (अपरिग्रह) tolerance, and innate love of peace and reverence for all living things. Too often are these precious assets forgotten and we tend to relapse into moods of pessimism, fears and forebodings, discord and destructive criticism. A new pride and a deeper faith expressed in living for the noble ideals of peace and freedom, truth and compassion are now needed.

1.84. In our efforts to go in a big way for science-based industrialization, we have the advantage of drawing upon a great stock of knowledge accumulated by the western world over the last two hundred years. We also have another lesson to learn. The industrialization of the West was in some ways brought about at no small cost to the human spirit. The two world wars resulting in human killing on an unprecedented scale are a grim reminder of that suffering of the spirit. If we learn the lesson right, we can harness science to support rather than weaken our basic commitment to cultural and spiritual values. It should be our goal and obligation to re-interpret, and raise to a new level of understanding, the insight gained by the ancient seers as regards the fundamental problems of life, which in some ways is unique and 'represents the quintessence of deepest insight into the happenings of the world'[1].

1.85. The opening stanza of the Kena Upanishad is as challenging today to the scientific and seeking mind as it was thousands of years ago:

केनेषितं पतति प्रेषितं मनः ।
केन प्राणः प्रथमः प्रैति युक्तः ।
केनेषितां वाचामिमां वदन्ति ।
चक्षुः श्रोत्रं क उ देवोयुनक्ति ॥

'By whom missioned falls the mind shot to its mark? By whom yoked does the first life-breath move forward on its paths? By whom impelled is this word that men speak? What god set eye and ear to their workings?'[2].

1.86. Atom and *Ahimsa*,[3] or, to put it differently, man's knowledge and mastery of outer space and the space within his skull, are out of balance. It is this imbalance which mankind must seek to redress. Man now faces himself. He faces the choice of rolling down a nuclear abyss to ruin and annihilation or of raising himself to new heights of glory and fulfilment yet unimagined. India has made many glorious contributions to world culture, and perhaps the grandest of them all is the concept and ideal of non-violence and compassion sought, expounded and lived by Buddha and Mahavira; Nanak and Kabir; Vivekananda, Ramana Maharishi and Gandhi in our own times, and which millions have striven to follow after them.

1.87. The greatest contribution of Europe doubtlessly is the scientific revolution. If science and *ahimsa* join together in creative synthesis of belief and action, mankind will attain to a new level of purposefulness, prosperity and spiritual insight. Can India do something in adding a new dimension to the scientific achievement of the West? This poses a great challenge and also offers a unique opportunity to the men and women of India, and especially to the young people who are the makers of the future. In this context we cannot do better than to quote Pandit Jawaharlal Nehru:

> Can we combine the progress of science and technology with this progress of the mind and spirit also? We cannot be untrue to science, because that represents the basic fact of life today. Still less can we be untrue to those essential principles for which India has stood in the past throughout the ages. Let us then pursue our path to industrial progress with all our strength and vigour and, at the same time, remember that material riches without toleration and compassion and wisdom may well turn to dust and ashes.[4]

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[1] E. Schroedinger, *What is Life*, Cambridge University, 1944.

[2] *Kena Upanishad* translated by Sri Aurobindo, Sri Aurobindo Ashram, Pondicherry, 1952.

[3] *Ahimsa*—Non-violence.

[4] *India and the World*, Azad Memorial Lectures, 1959, Indian Council for Cultural Relations, New Delhi, 1962.

CHAPTER II

EDUCATIONAL SYSTEM : STRUCTURE AND STANDARDS

I *General Approach.* (2).

II *Structure and Duration.* (7) Popular interest in structure and duration; (8) The higher secondary pattern; (10) Uniformity of pattern; (12) Demand for lengthening the duration of schooling; (13) Proposed reorganization of the educational structure.

III *Reorganization of School Education.* (15) The first ten years; (18) Modification of the higher secondary pattern; (19) Vocational courses at the end of the primary stage; (20) Courses corresponding to higher secondary stage; (22) Transfer of the pre-university course; (25) Programme for lengthening of duration; (28) Vocationalization at the higher secondary stage.

IV *Reorganization at the University Stage.* (31) Proposals for reorganization.

V *Utilization of Facilities.* (35) Working and instructional days: (36) Illustrative academic calender; (39) Utilization of vacations; (41) School hours; (42) Adequate utilization of institutional facilities.

VI *Dynamic and Evolving Standards.* (44) Criteria for evaluating standards; (46) Recommendations; (48) Proper articulation between the different stages of education; (49) The role of universities and colleges; (50) The school complex.

VII *General.* (53) Three channels of education. (55) Nomenclature.

2.01. In this chapter, we shall deal mainly with the structure or the pattern of the educational course, the duration of the total course and of its different stages, the better utilization of time and other educational facilities, the necessity of continually raising standards at all stages and the provision of all the three channels of education—full-time, part-time and own-time—on an adequate scale.

GENERAL APPROACH

2.02. To begin with, we would like to state our approach to the problems of structure and standards. The standards in any given system of education at a given time depend upon four elements. (1) the structure or the division of the educational pyramid into different levels or stages and their inter-relationships; (2) the duration or total period covered by the different stages; (3) the extent and quality of essential inputs such as teachers, curricula, methods of teaching and evaluation, equipment and buildings; and (4) the utilization of available facilities. All these elements are inter-related, but they are not of equal significance. For instance, the structure, which may be regarded as the skeleton of the educational system, is of the least importance. The duration or total period of education plays a more significant role; but it becomes crucial only when the available facilities are utilized to the full and no further improvement can be expected without the addition of time. The quality of different inputs is even more important, and with an improvement in these, it is possible to raise the standards considerably without affecting the structure or increasing the duration. But the utilization of available facilities is probably the most significant of all elements on which standards depend. For any self-accelerating process of development, it is essential in the first place to improve efficiency at the level of the existing inputs and to add more inputs only if they are crucial to the process. An increase of inputs assumes significance only at a later stage.

2.03. In this context, it may be interesting to note that until recently, the general tendency everywhere has been to overrate the importance of the duration of the school course. There is a reason for this. When the quantum of knowledge covered in the school was not very large, the pace of school work was leisurely and when one learnt more outside school than within school, it was natural to suppose that the longer one stayed at school the better one gained in knowledge and maturity. All this has changed now. The knowledge explosion has imposed an altogether new pressure on schools and colleges. Formal education now plays a much greater part than it did previously at any time in history and the efficiency of the educational system has become a very important factor. Machlup, in his monumental study on the *Production and Distribution of Knowledge in the United States* (The Princeton University Press, 1962) has observed that the learning process in school in the United States could and ought to be accelerated. He has vigorously argued that the educational objectives now attained in 12 years of schooling could be achieved in 9 or 10 years. This would mean a saving every year of tens of billions of dollars. Besides, it will save the precious time of students and teachers. This 'time-saving' is becoming increasingly important as there is so much more to learn in a fast knowledge-expanding world. The compression of the school course would also help in the development of satisfactory working habits and powers of concentration and application. Machlup says that reducing the school duration from the present 12 to 9 or 10 years does not mean that the school course is to be cut down. 'Nothing is to be cut out; on the contrary, more is to be put into the curriculum. But the students have to get a faster start and a continuous stretch of their minds.' We are informed that some schools in New York City are experimenting on the reduction of the school duration.

2.04. The observations of Jerome B. Weisner, former Science Adviser to the U.S. President, are pertinent in this context. He says[1];

> Many people are impressed by the fact that the Soviet Union's ten-year cycle of primary and secondary education requires that all students must take five years of physics, six years of mathematics, three years of biology, and four years of chemistry, with the course content of the work during the last two years being comparable to that of the usual introductory courses in these subjects offered in our liberal arts colleges. By contrast our corresponding school period contains twelve rather than ten years but provides on the average only one-fifth as much training in mathematics and the sciences. There is insufficient evidence to show that the intensity of early Soviet scientific training is either necessary or desirable, particularly if it involves sacrifices of some emphasis on the humanities, but it is evident that the standard programme in our schools is far from optimum.

2.05. It has also to be noted that the broad pattern of education in our country, which was imported from abroad, is still in the nature of an exotic plant. There is hesitation and reluctance and sometimes even fear, about making any radical changes unless these are on the model of what is happening abroad. We have to outgrow this attitude and come to regard the educational pattern as our own; and we should introduce changes in it on the basis of our *own indigenous thinking,* after taking into account what is happening outside but without being dominated by it.

2.06. It is in the light of these fundamental principles that the proposals made in this chapter should be viewed.

STRUCTURE AND DURATION

2.07. **Popular Interest in Structure and Duration.** Questions on structure and duration were those on which the Commission received perhaps the largest volume of advice and suggestions. They are questions to which previous commissions and committees dealing with the problems of education on a national scale have devoted considerable attention. There are two principal reasons for this widespread and continuous concern about the structure of the educational system. One is the general desire that the present somewhat confusing variety of patterns of school and higher education should be ended. The other is the popular belief that the total period of the educational course and the duration of its different stages have a direct bearing on the quality of the education imparted. We have been repeatedly told that, if there is a uniformity in the educational pattern and an extension in the total period of schooling, it will be possible to bring about a general rise in the standards of attainment. These contentions are of considerable importance and merit close examination.

2.08. **The Higher Secondary Pattern.** It may be instructive in this connection to look briefly at the results of one serious effort made since independence to carry out a plan for the reorganization of the educational structure. As a result of the Report of the Secondary Education Commisssion, a decision was taken to develop a national pattern of school classes covering eleven years—five years of lower primary, three years of upper primary and three years of higher secondary classes. This was to be followed by a three-year course for the first degree in arts and science and a further two-year course for the second degree. The upgrading of high schools in accordance with what is popularly known as the higher secondary pattern and the introduction of the three-year degree course in universities have been significant changes in the educational structure over the last ten years. But while the three-year degree course has been introduced everywhere except in the State of Uttar Pradesh[1] and the University of Bombay, the same success has not attended the efforts to convert high schools into higher secondary schools. In spite of the offer of Central assistance, only five States have implemented the proposal so far, while the others have either not accepted it at all, or having decided to accept it in the first instance, have gone back on their earlier decision. Only about 25 per cent of the total number of secondary schools in the country were converted to the higher secondary pattern by the end of the third plan. Many of these conversions are purely notional in the sense that the necessary facilities in terms of teachers, libraries and laboratories have not yet been provided. What is particularly relevant to our discussion here is that no uniform pattern of school and college classes has emerged as a result of the reorganization and there is almost as great a variety of patterns today as there was when the scheme of reorganization was first launched. This will be seen from the data given in Table 2.1 and in the two charts on pages 26 and 27.

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[1] Daedalus, 1965, p. 534.

TABLE 2·1. PATTERN OF SCHOOL AND COLLEGE CLASSES IN DIFFERENT STATES (1965-66)

State	Lower primary	Higher primary	Secondary	PUC	Higher secondary	First degree	Total
Andhra Pradesh	5	3	3	1	4	3	15
Assam & Nagaland . . .	5	3	4	1	5	3	16
Bihar, Gujarat & Maharashtra . .	7(a)	..	4	1	..	3(b)	15
Jammu & Kashmir, Punjab, Rajasthan & West Bengal .	5	3	2	1	3	3	14
Kerala	4	3	3	2	..	3	15
Madhya Pradesh	5	3	..	..	3	3	14
Madras	5	3	3	1	..	3	15
Mysore	4	3	3	1	4	3	14
Orissa	5	2	4	1	..	3	15
Uttar Pradesh	5	3	2	..	2(c)	2	14

(a) Integrated primary course, there being no separate middle schools.
(b) In the University of Bombay there is a two-year intermediate course followed by a two-year degree course.
(c) Refers to Intermediate colleges.

N.B. (1) The figures indicate the duration of the stage in years. In totalling up, please include (*i*) Secondary and PUC or (*ii*) Higher Secondary, but *not* both.

2. Among the Union Territories, Delhi, Andaman and Nicobar Islands and Laccadive, Minicoy and Amirdivi Islands have adopted the higher secondary pattern. The other Union Territories usually follow the pattern of the State with whose Secondary Board or Universities they coordinate their educational programmes (*e.g.*, Himachal Pradesh follows Punjab).

2.09. Some witnesses who gave evidence before the Commission were of the view that the higher secondary pattern had not been given a fair trial. They believed that frequent changes of policy with regard to the educational structure were undesirable and that, instead of experimenting further with new patterns, it would be better to implement the higher secondary scheme itself more effectively all over the country. But a large majority were extremely critical of the scheme for the following reasons, among others:

(1) Specialization which should not be introduced till after Class X or the age of 16 begins too early in the pattern (after Class IX or at the age of 13 or 14).

(2) The three-year integrated course in the higher secondary classes leads to a good deal of unnecessary expansion and increase in expenditure, as a child, who might otherwise have stepped off into the world of work or a vocational course at the end of Class V, is now forced to go up to Class XI.

(3) The expectations that standards would improve as a result of the reorganization have not been generally realized. Qualified teachers are unwilling to work in higher secondary classes because of lower salaries, and even where salaries are equal, because of lower status. Moreover, for reasons other than educational, a number of high schools have been upgraded to the higher secondary pattern without any appreciable improvement in their accommodation and equipment or the qualifications of their staff.

(4) The experiment which is costly in itself has led in certain areas to an increase in expenditure in other directions. For instance, it was found almost impossible in practice

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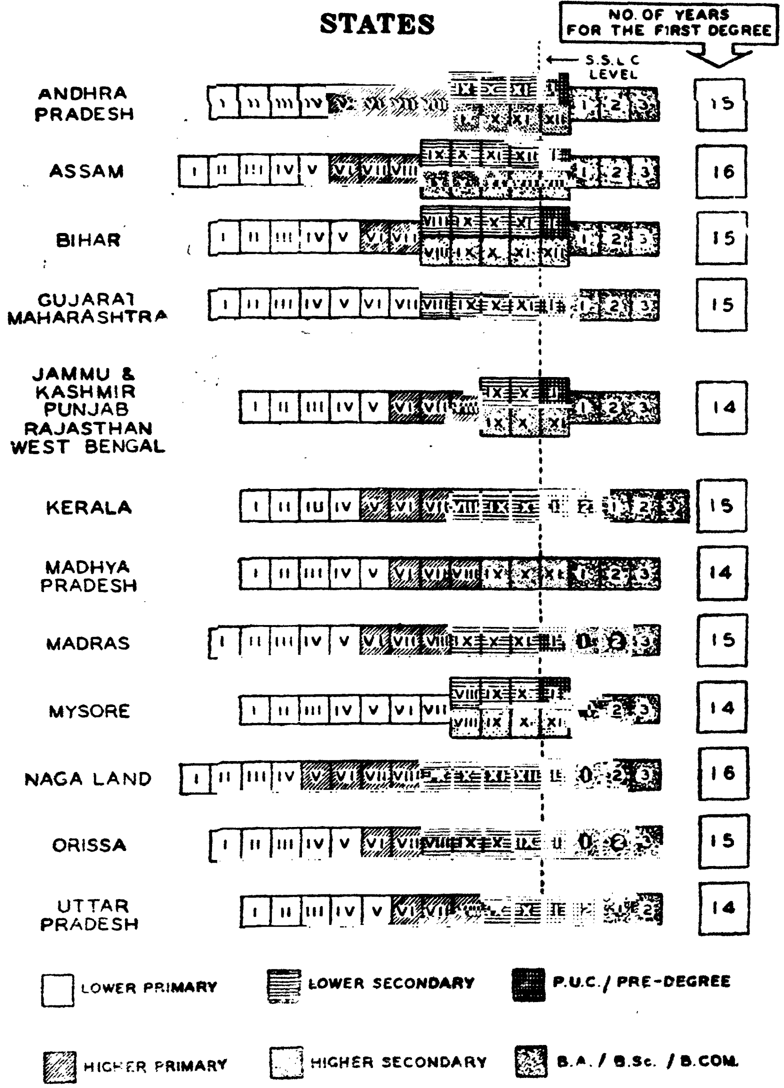
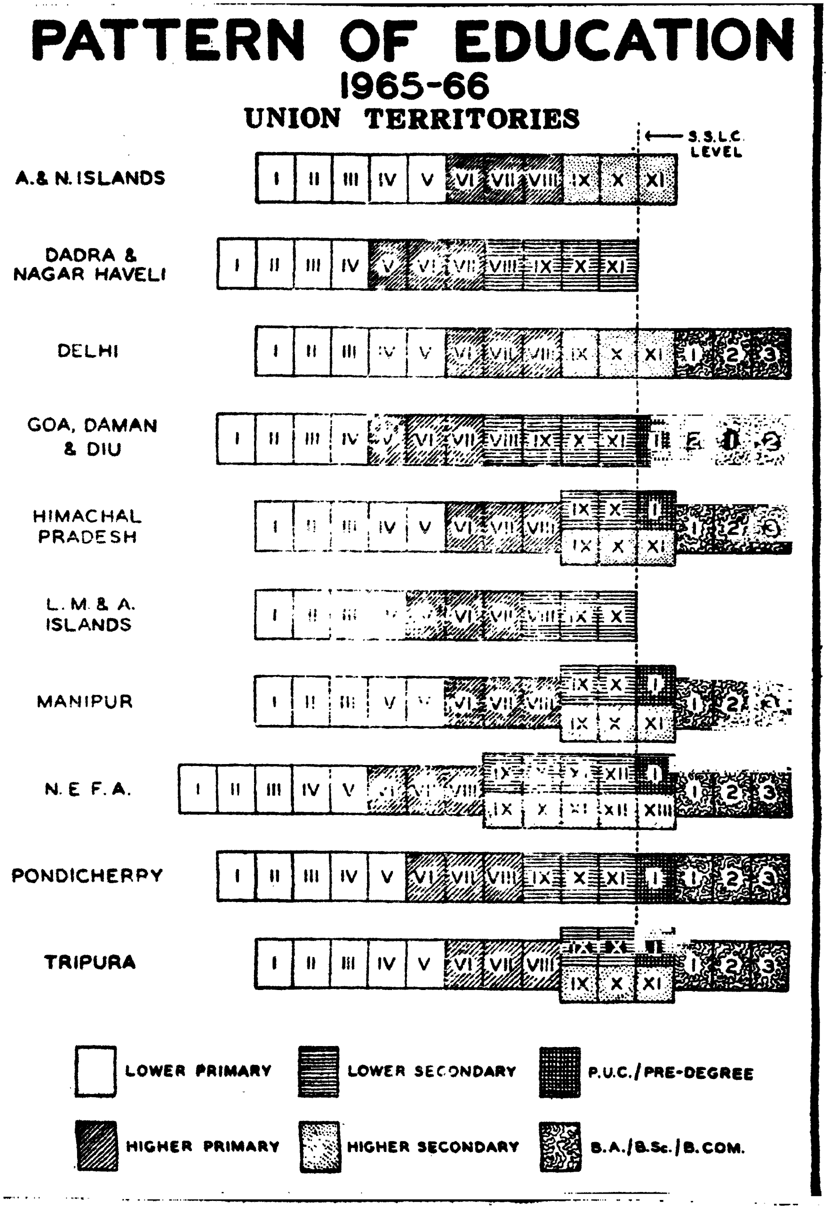
[1] Excluding Central Universities.

PATTERN OF EDUCATION

1965–66

STATES




PATTERN OF EDUCATION
1965-66
UNION TERRITORIES
S.S.L.C. LEVEL
A.& N. ISLANDS
DADRA & NAGAR HAVELI
DELHI
GOA, DAMAN & DIU
HIMACHAL PRADESH
L. M. & A. ISLANDS
MANIPUR
N. E. F. A.
PONDICHERRY
TRIPURA
LOWER PRIMARY
LOWER SECONDARY
P.U.C./PRE-DEGREE
HIGHER PRIMARY
HIGHER SECONDARY
B.A./B.Sc./B.COM.

to downgrade an intermediate college to a higher secondary school so that every intermediate college had to be raised to the costlier degree level. Similarly, the decision to convert, over a period of time, all high schools to the higher secondary pattern, created undesirable pressures. Even small rural high schools, which under the previous system would have been more efficient and economical as ten-class institutions, were upgraded to the higher secondary status and became both costly and less efficient.

2.10. **Uniformity of Pattern.** A number of different proposals for the reorganization of the educational structure were placed before the Commission. Most of these recommended a uniform pattern of school and college classes in all parts of the country. It may be pointed out in this connection that the Committee on Emotional Integration stated in their Report (1962) as follows:

> We consider that in the over all interest of our student population there should be a common pattern of education in the country which will minimise confusion and coordinate and maintain standards.

This view has been gaining considerable ground in recent years. The concept of a national system of education has been increasingly linked with the adoption of a uniform educational pattern and a belief has grown that such uniformity is essential for raising standards.

2.11. We have recommended elsewhere[1] certain steps that should be taken for the coordination of educational standards at the school stage in the different States. But we do not believe that it is necessary or desirable to impose a uniform pattern of school and college classes in all parts of the country. There are several characteristic features of the Indian situation such as the vastness of the country and the immense diversity of local conditions and traditions that demand a certain element of flexibility in the educational structure. We are aware of other national systems of education which have a variety of educational patterns. Even in a country of small size such as the United Kingdom, for example, the pattern in England (generally thirteen years of school education followed by a three-year course for the first degree) is different from that in Scotland (twelve years of school education followed by a four-year course for the first degree). In our country, where the different States are at unequal levels of development, a uniform pattern might be *above* the resources and real needs of the backward areas and *below* the capacity and requirements of the advanced areas and might operate to the disadvantage of both.

2.12. **Demand for Lengthening the Duration of Schooling.** A second popular demand that has been stressed in proposals for structural reorganization received by the Commission, is related to lengthening the total duration of school and higher education. This demand, it may be pointed out, is not related to the professional degree such as engineering or medicine, the total duration of the study for which is not less than 16 years and is about the same as in most of the educationally advanced countries. This demand only refers to the first degrees in arts and science, which are now taken four years after the matriculation or an equivalent examination (or three years after the higher secondary course of eleven years), and the contention put forward is that this duration should be lengthened to not less than five years after the matriculation (or four years after the higher secondary). This view, it must be pointed out, accords with the thinking of several expert bodies on the subject. As far back as in 1919, the Calcutta University Commission proposed that the dividing line between the university and the secondary school should be drawn at the intermediate examination, which came after twelve years of education. Similarly, the University Education Commission (1948) recommended that students should be admitted to the University after the completion of twelve years of study, and that the first degree course should be of three years duration. According to the Committee on Emotional Integration (1962), the eleven-year period of school education was inadequate preparation for entrance to the university and the lengthening of the course by one year was deemed necessary. At the conference of the State Education Ministers held in 1964, it was resolved that 'a twelve-year course of schooling before admission to the degree course was the goal towards which the country must work'. We are in full agreement with these recommendations.

2.13. **Proposed Reorganization of the Educational Structure.** The kind of reorganization suggested above, which involves a lengthening of the duration of school education, cannot obviously be effected within a short period. The vastness of the country and the variety of its educational patterns make the task a formidable one, and the pressure of more urgent claims on the limited educational resources adds to the complexity of the problem. We recommend that the reorganization should be carried out through a phased programme spread over at least twenty years. The first step in this direction would be the abandoning of the present higher secondary pattern in which specialization begins in Class IX, and the institution of a new higher secondary course beginning in Class XI. Along with this measure, which should be completed by the end of the fourth plan period, a systematic attempt should be made to transfer the pre-university course at present located in universities and affiliated colleges, where it tends to depress standards of higher education, to secondary schools, where it rightly belongs. The next step would be to lengthen the total duration by adding a year to the higher secondary course. All these measures are discussed in detail in a later section of this chapter.

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[1] Chapter X.

2.14. We visualize a flexible educational structure covering

- a pre-school stage of one to three years;
- a primary stage of seven or eight years divided into two sub-stages—a lower primary stage of four or five years and a higher primary stage of three years;
- a lower secondary or high school stage of three or two years in general education or of one to three years in vocational education;
- a higher secondary stage of two years of general education or one to three years of vocational education;
- a higher education stage having a course of three years or more for the first degree and followed by courses for the second or research degrees of varying durations.

The organization of pre-primary education is dealt with separately in Chapter VII. We shall now deal with details of the reorganization at the school and the higher education stages.

REORGANIZATION OF SCHOOL EDUCATION

2.15. **The First Ten Years.** The primary and secondary schools will be of various types. The largest single group amongst them will consist of lower primary schools. A smaller number—about one in three—will provide education to the end of the higher primary stage and these would necessarily include the lower classes. When the present higher secondary pattern is abandoned, most of the secondary schools—about three-fourths—would provide education up to Class X and may begin at any convenient point lower down; and the remaining one-fourth will be higher secondary schools providing education up to university entrance. The existing position, however, is quite different from this and shows considerable variations in the structure of the school system until the public examination at the end of the lower secondary stage is reached. A reference to chart on page 31 shows that this external examination which is known by different names, but which we shall call the high school examination, comes after ten to twelve years: two States (Assam and Nagaland) have the examination after twelve years: six States (Andhra Pradesh, Bihar, Gujarat, Madras, Maharashtra and Orissa) have it after eleven years; and the remaining eight States (Jammu & Kashmir, Kerala, Madhya Pradesh[1], Mysore, Punjab, Rajasthan, Uttar Pradesh and West Bengal) have it after ten years. No systematic study has yet been made for comparing the standards of attainment of the candidates at the examinations held in the different regions. But these are broadly comparable and for administrative purposes, all these examinations are regarded as equivalent.

2.16. It will be seen from the chart that in Assam and Nagaland, the first two classes are called A and B, and it is the next ten classes that are numbered consecutively as Classes I to X. Since the Governments of the two States themselves seem to treat Classes A and B as Infant Classes and separate them from the other ten classes, the school stage leading to the high school examination in these States may be regarded as covering a period of ten years. In the six States which have a eleven-year school course, it is more appropriate to regard Class I as a pre-primary class, particularly where the age of admission is less than six years. We believe that this pre-primary class is an advantage which these States possess. We recommend that they should try to retain it as such, organize the learning experiences therein on the play-way pattern rather than on the formal pattern, and extend it downwards, wherever possible, to cover a period of two years. We also suggest that the other eight States may try to provide pre-primary education of one year or more below Class I to the extent possible, subject to the availability of financial resources.

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[1] This examination is not held at present in Madhya Pradesh where all the schools are of the higher secondary status. But it is proposed to reintroduce it in 1967.

2.17. As we visualize,

(1) the first ten years of schooling, covering a primary stage of seven or eight years and a lower secondary stage of three or two years, will provide a course of general education without any specialization;

(2) the primary stage will be preceded, wherever possible, by pre-primary education of one to three years;

(3) the age of admission to Class I will ordinarily be not less than 6+;

(4) at the end of the primary stage, a proportion of students will step off the school system and enter working life (about 20 per cent); some more will step off the stream of general education into different vocational courses whose duration may range from one to three years (about 20 per cent); and the remaining will continue further in the stream of general education (about 60 per cent):

(5) the ten years of school education will be followed by an external examination;

(6) the standard at the end of the ten years will be broadly comparable in respect of curriculum and level of attainment to the national standard laid down for the end of this stage;

(7) at the end of the ten years of school education, a proportion of students will step off the school system and enter working life (about 40 per cent.); some more will step off the stream of general education and enter vocational courses whose duration will be one to three years (about 30 per cent); and the remaining will continue further in the stream of general education whose duration will be one, and ultimately two years (about 30 per cent.).

2.18. **Modifications of the Higher Secondary Pattern.** We attach great significance to changes that have to be made in the existing higher secondary pattern in the light of the proposals for reorganization made above.

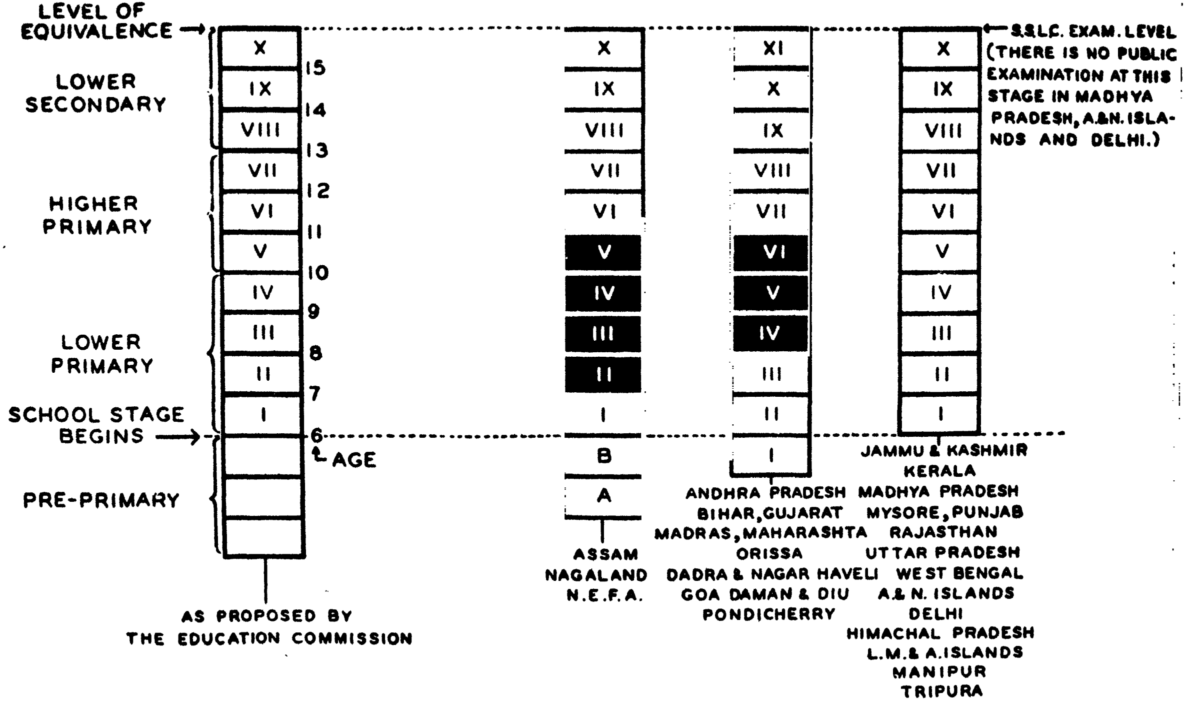
(1) As has already been stated, the system of 'streaming' in schools of general education, which now begins in Class IX, should be given up and no attempt at specialization should be made till after Class X. This will need a considerable reorganization of the existing curricula of the higher secondary schools.

(2) The idea that every secondary school should be raised to the higher secondary status should also be abandoned. It has been possible to upgrade all the high schools in Delhi because it is a metropolitan area. Such wholesale conversion of schools has also been carried out in Madhya Pradesh; but the cost has been very heavy in terms of deterioration of standards as well as of financial outlays. In a country where rural areas predominate, it is unwise to try to raise *every* high school to the higher secondary status. We visualize, as a permanent feature of the educational system, secondary schools of two types: high schools providing the ten-year course described above, and higher secondary schools which in due course will offer a twelve-year course of education. With a view to concentrating resources and raising standards effectively, it is only the bigger and better type of high schools that should be upgraded. If one-fourth of the total number of high schools were raised to the higher secondary status, they would meet all the needs of the situation, even on the assumption that there would be no pre-university courses in the colleges in the future. An essential requirement is that the institutions should be large, centrally located and equitably distributed between the urban and the rural areas. It would also be desirable to review the status of all existing higher secondary schools, and where these are too small and uneconomic or of very poor quality, they may be reconverted into high schools.

(3) There should be, as a rule, no integrated course of studies beginning with Class IX. Classes IX and X will now form part of the first ten years of general education, and Classes XI and XII (and during the transitional period, Class XI only), which will provide for specialized studies in different subjects at the higher secondary stage, will become an independent, self-contained unit like the Sixth Form in England.

EQUIVALENCE OF SCHOOL CLASSES I-X

1965-66



(4) There will be an external examination at the end of Class X to mark the termination of the first ten years of general education. Therefore, a student studying in a ten-year high school will have to appear for two external examinations—at the end of Classes X and XI—at the interval of one year. This handicap will be removed with the extension of the higher secondary course to two years.

(5) Existing higher secondary schools with a well-organized integrated course in Classes IX to XI may be permitted to carry on, if they so desire, with such course until they add Class XII. It will not be obligatory for the students of such schools to appear for an examination at the end of Class X. They may take one final examination at the end of Class XI or take it in two parts at the end of Classes X and XI.

2.19. **Vocational Courses at the End of the Primary Stage.** It has been stated above that about 20 per cent of the students will leave the educational system and join working life at the end of the primary stage and that about an equal proportion will step off from the stream of general education and join vocational courses. It will be necessary to provide adequate facilities for suitable forms of vocational education, either on a part-time or on a full-time basis, for these students. This problem will be discussed in greater detail elsewhere[1].

2.20. **Courses Corresponding to the Higher Secondary Stage.** The name, duration, location and control of courses corresponding to the higher secondary stage vary from State to State. In Uttar Pradesh, the course is designated as 'Intermediate' and the duration is two years. It is located either in the top classes of secondary schools or in the bottom classes of degree colleges, and its academic control is vested in the Board of High School and Intermediate Examinations. In Kerala, the course is provided in institutions called 'Junior Colleges', which are sometimes independent and sometimes attached to affiliated colleges, and its control vests with the university. In Madhya Pradesh, where all secondary schools have been raised to the higher secondary pattern, there is no course at this stage outside the higher secondary schools. In States where the higher secondary pattern is adopted but all high schools have not been raised to the higher secondary status, this stage is provided as Class XI in the higher secondary schools and pre-university courses in colleges. All other States provide a pre-university course exclusively located in colleges and controlled by the universities.

2.21. In discussing the proposed reorganization of the educational structure, we pointed out that two main reforms were needed at this stage:

- the transfer of the pre-university courses from the universities and the colleges to the schools; and
- the lengthening of the duration of the courses of general education uniformly to two years.

In our view, the simpler and more efficient way of carrying out these reforms would be to take up their implementation in two successive stages. In the first stage, the pre-university, intermediate or junior college courses should be transferred from higher education to school education in a period of ten years (1966-75): in the second, their duration should be lengthened, *in situ* as it were, in a fifteen-year period beginning with the fifth plan (1971-85).

2.22. **Transfer of the Pre-University Course.** We attach great significance to the location, *exclusively* in the schools, of all the courses that form part of higher secondary education. When the higher secondary pattern was first recommended, the pre-university course was introduced only as a *transitional* measure. Unfortunately, the transition threatens to become permanent, and even today about 40 per cent of the total enrolment in the universities and affiliated colleges is in the intermediate or pre-university courses. This is a great evil from all points of view. It is bad for the universities and colleges as their resources and energies are being improperly utilised and even wasted in doing what is essentially the work of secondary schools. It is bad for the secondary schools because they are weakened by being deprived of a stage which could give them good teachers and facilities, with the result that they are obliged to do a good deal of work which ought to have been done at the primary stage. It is bad for the students because they are now required to enter universities at too early an age, and compelled to learn through methods of higher education which are beyond their capacity and more suited to maturer students. We, therefore, strongly recommend that the pre-university course, irrespective of its duration, should first be transferred to the school on a high priority basis—this transfer to be completed by the end of the fifth five year plan at the latest.

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[1] Chapter VII.

2.23. The following measures may be adopted to bring about this transfer:

(1) The responsibility for transferring all pre-university or intermediate work from the universities and affiliated colleges should be placed on the University Grants Commission, which should be asked to prepare a phased programme to be spread over not more than ten years for the purpose. A beginning should be made with the universities and the postgraduate colleges which should be required to shed this work as soon as practicable. This policy should then be extended to degree colleges, where the enrolments at this stage should be frozen at a certain time, after which the colleges would be required to taper them off as their enrolments at the undergraduate stage begin to grow. Beyond the fourth plan, the opening of new pre-university or intermediate classes in the universities and affiliated colleges should not be permitted. The University Grants Commission and the State Governments should be requested to reduce gradually their allotment of funds earmarked for this stage of education and to stop them completely by the end of the fifth plan.

(2) While these steps are being taken, arrangements should be made to start the higher secondary class or classes in selected schools. The responsibility for making these arrangements should be placed on the State Education Departments, which should work out a proper programme for the purpose in consultation with the universities in the State. Good high schools should be selected and given adequate grant-in-aid to start a higher secondary class or classes as a self-contained unit which is not to be integrated with the lower classes, so that students from other high schools may join it. A scheme of this type has been tried in Mysore and found to work well. Recurring grants for this purpose should be made available to each selected institution one year in advance so that the preliminary arrangements can be satisfactorily completed in time.

(3) Most of the Boards of Secondary Education will have to be reconstituted to accept the responsibility for the higher secondary stage, and in some cases, their Acts will have to be amended. We shall discuss this matter in detail in Chapter X.

2.24. This programme of transfer will not involve any wastage. The universities and the affiliated colleges from which the pre-university courses will disappear will be able to utilize the existing facilities so released for the purpose of expanded admissions in undergraduate classes. For creating the new facilities required at the school stage, however, a much larger investment of resources is needed. The non-recurring expenditure will be much greater, because most of the secondary schools are in a very bad shape at present. Even with regard to recurring expenditure, there will be an overall increase, because the income from fees may show a fall after a transfer of these classes to the schools. But the advantage of this additional investment will be spread, to some extent, over a very large proportion of the student population at the secondary stage and the benefit to society in terms of a better output from secondary education, will be much greater. There should, therefore, be no hesitation in incurring the somewhat larger expenditure involved in the execution of this programme.

2.25. **Programme for Lengthening of Duration.** Our second proposal in this regard is that, in all the States except Uttar Pradesh and Kerala, the duration of the higher secondary course should be lengthened to two years through a phased programme spread over twenty years and divided into two stages. The first stage covering a period of five years, should be devoted to securing a better utilization of existing facilities and to making the needed preparation for a successful implementation of this important reform. Even during this period, selected higher secondary schools should be permitted to add the twelfth year, and even some high schools of good quality and possessing the necessary facilities may be allowed to introduce the two-year higher secondary course as pilot projects. The second stage will cover a span of fifteen years: the programme of extending the duration should begin in the fifth plan, gather momentum in the following decade, and be completed by the end of the seventh plan.

2.26. Some explanation is necessary for the first stage of implementation referred to above, which implies a postponement of the actual programme of lengthening the duration to the fifth plan. We recommend such postponement for three important reasons:

(1) The first reason is that of priority. There are three possible choices in school or higher education in the next five years: qualitative improvement of general education (with special emphasis on raising the salaries and qualifications of teachers); vocationalization of secondary and higher education; or lengthening of the duration of the total period of general education. In our opinion, the first two of these are of far greater urgency and may absorb all the additional resources likely to be available during the next five years.

(2) The second reason is our anxiety for improving the utilization of the time already available before the duration of the school course is lengthened. We would emphasize that a hasty addition of one year to secondary education will not lead to qualitative improvement unless there is a proper climate of hard work in the educational institutions. Moreover, 'time' is only *one* of the 'inputs' that can bring about improvement in quality. There are several other 'inputs' that are necessary for raising standards, *e.g.*, motivation of students, competence of teachers, upgraded curricula, better methods of teaching and evaluation, improved textbooks and teaching materials and adequate equipment, buildings and other physical facilities. Qualitative improvement will result from the cumulative effect of all these factors. If they are of the right kind, an increase in the duration will certainly add to the improvement in quality; but if they are not, the extension of the course by a year may only mean a still further increase in existing wastage.

(3) The third reason is related to the need to make advance preparation for the lengthening of the duration. In our opinion, it will be nothing short of wasting scarce resources if State Governments embark on this programme without adequate preparatory work. This requires (a) that State Governments should take the necessary steps, right from the moment the proposal is accepted, to expand postgraduate education and to prepare the needed teachers; and (b) that they should select, by way of a pilot project, good secondary or higher secondary schools and permit them to add two or one-year courses, as the case may be. On the completion of these courses, the students should be able to join the undergraduate courses at the appropriate points. This will be broadly equivalent to the 'advance placement programme' in the USA. We think that it will be of considerable help to several students who would prefer to work, for some time longer, with their own school teachers and in their own school atmosphere rather than transfer themselves abruptly to a new and unfamiliar environment.

2.27. In this connection, it is interesting to note that the Committee on Higher Education in the United Kingdom, after considering a somewhat similar suggestion for lengthening the duration of the first degree course in the United Kingdom from three to four years, turned it down principally on the ground that a general extension of the course would not be justified while students were not making proper use of the vacations. This reinforces the view that the proper policy to be adopted in this matter, especially in a developing country, is to increase the duration only after all steps have been taken to maximise the utilization of the time already available. It is for this reason that we have recommended the postponement of the programme of lengthening the duration to the fifth plan. But once the utilization is improved and necessary preparations are made, the programme should be started on a big scale and completed by 1985.

2.28. **Vocationalization at the Higher Secondary Stage**. We must emphasize particularly the need to vocationalize higher secondary education and to expand the vocational courses to cover about half of the total enrolment at this stage. A large variety of terminal courses should be organized, varying in duration from one to three years. They will include courses for the training of primary and pre-primary teachers; courses conducted by the industrial training institutions for a large number of trades for which the completion of studies in Class X is the minimum qualification; courses in agriculture and industry which will train the middle level of personnel needed; courses for training para-medical/health personnel; courses for secretariat work; and courses in home science. It is such courses that will make secondary education mainly terminal. The problem is discussed in detail elsewhere.[1]

2.29. **To Sum Up.** We recommend that—

(1) the higher secondary stage should be extended to cover a period of two years and should be located exclusively in the schools.

(2) steps should be taken to implement this reform through a phased programme spread over the next 20 years (1965-85).

(3) as a first step in this direction, the pre-university course, irrespective of its duration, should be transferred from the colleges to the schools on a high priority basis within the next ten years.

(4) simultaneously, attempts should be made in the fourth five year plan for improving the utilization of the existing period to the best extent possible, for the preparation of teachers for the two-year course by expanding and improving the post-graduate stage, and for the working out of pilot projects with two-year higher secondary courses in selected secondary schools.

(5) with the beginning of the fifth five year plan (1971-72), the implementation of the programme should start on a large scale and it should be completed by the end of the seventh plan (1985-86).

(6) provision should also be made from the very outset for the introduction of different types of vocational courses at the higher secondary stage, varying in duration from one to three years which would prepare young persons for employment.

The changes proposed here have been shown graphically in the chart on page 37.

REORGANIZATION AT THE UNIVERSITY STAGE

2.30 Prior to 1947, the pattern of higher education was largely uniform in all parts of the country. The duration of the course leading to the first degree in arts and science was two years, and this was followed by a two-year course leading to the second degree. But several changes have been introduced into the pattern since independence. The most important is that the duration of the course for the first degree in arts, science and commerce has been lengthened to three years in all the universities except those in Uttar Pradesh and the University of Bombay, which still provide the two-year degree course after the Intermediate Examination. One or two universities have experimented with an honours course in certain subjects, covering a period of four years in the aggregate. Again, the degree courses in professional subjects are generally longer than the courses for the degrees in arts and science. The agricultural and the engineering courses extend to four and five years respectively after the pre-university course and the medical course has an even longer duration.

2.31. **Proposals for Reorganization.** Since progress in higher education lies through freedom to experiment, there can be no objection to this variety. The principal criticism of higher education is directed, however, not so much against the pattern of organization as against the comparatively low standards of the degree awarded by the Indian universities in arts, commerce and science. The causes for these low standards are discussed in a later section. We are concerned here only with the question of the structural reorganization necessary at the university stage for the improvement of standards. The following proposals are made in this connection:

(1) The duration of the first degree course should not be less than three years. Apart from this, there should be no rigidity about the duration of courses in higher education. These may vary from university to university, and even in the same university, from subject to subject. The duration of courses for the second degree may be two or three years.

(2) In some universities, strong 'graduate schools' providing a three-year M.A./M.Sc./M.Com. degree course may be established in certain subjects. For the sake of convenience, these courses may be designated as honours courses or they may be given some other suitable name. If they are properly

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[1] Chapters VII, XIV and XV.

organized and a careful selection of students is made, they will be able to produce excellent personnel for the teaching faculty and for high grade research.

(3) A beginning should also be made with the organization of four-year special courses for the first degree in selected subjects. The first year of these courses will be the same as the first year of the present three-year degree course. But students will be selected, at the end of that year, for admission to a further three-year special course leading to the first (special) degree in the subject. The experiment should be tried, in the first instance, in the university departments only and in subjects where teachers and facilities are available. In the light of the experience gained, it may be extended subsequently to other subjects and to good affiliated colleges doing postgraduate work.

(4) The above proposal will need to be modified in Uttar Pradesh, where the immediate problem is to raise the duration of the first degree course in arts, commerce and science from two to three years. Since large financial and personnel problems are involved, we suggest that this programme should be spread over 15 to 20 years. A beginning may be made with the establishment of graduate schools and challenging three-year courses to be introduced in selected subjects and selected universities; and as funds and teachers become available, the programme should be extended to affiliated postgraduate colleges doing good work and to other subjects.

(5) Suitable 'bridges' should be built between these new and longer courses and the existing courses of shorter duration.

(6) Some incentives will have to be provided to students for undergoing these longer and higher level courses.[1] For instance, a more liberal provision of scholarships should be made for these longer courses for the first and the second degrees. Students completing the courses should be entitled to advance increments in the usual scales. They should receive preferential consideration in recruitment; and as soon as the supply becomes adequate, the recruitment of teachers should be restricted to the holders of these degrees only. It need hardly be stressed that the admissions to these courses should be made on a highly selective basis.

2.32 Just as we laid considerable stress on the vocationalization of secondary education we would also like to emphasize the importance of professional education at the university stage. This is of particular urgency in the Indian context where the emphasis in higher education in the past has been on training persons mainly for white-collared jobs. Our proposals on this subject are discussed elsewhere.[2]

UTILIZATION OF FACILITIES

2.33. The principal object of the changes in structure and duration which have been discussed above is to raise standards. In this context, however, it is essential to note that

— structure and duration play a significant but secondary role in improving standards;

— the changes proposed in structure and duration will be rather slow in making an impact on quality, because their full implementation has been spread over twenty years; and

— the most serious weakness of the existing educational system lies, not in its structure, but in its feebleness. We are getting relatively much less than what we should from the system as it exists and the resources that go into it. No reorganization of structure or addition of time can remedy this basic weakness.

It is, therefore, necessary to place a much greater emphasis in all our plans of educational reconstruction on programmes of intensive utilization of facilities available, and on improving the extent and quality of the inputs other than time, and particularly on the improvement of teachers. These will yield immediate and far-reaching results.

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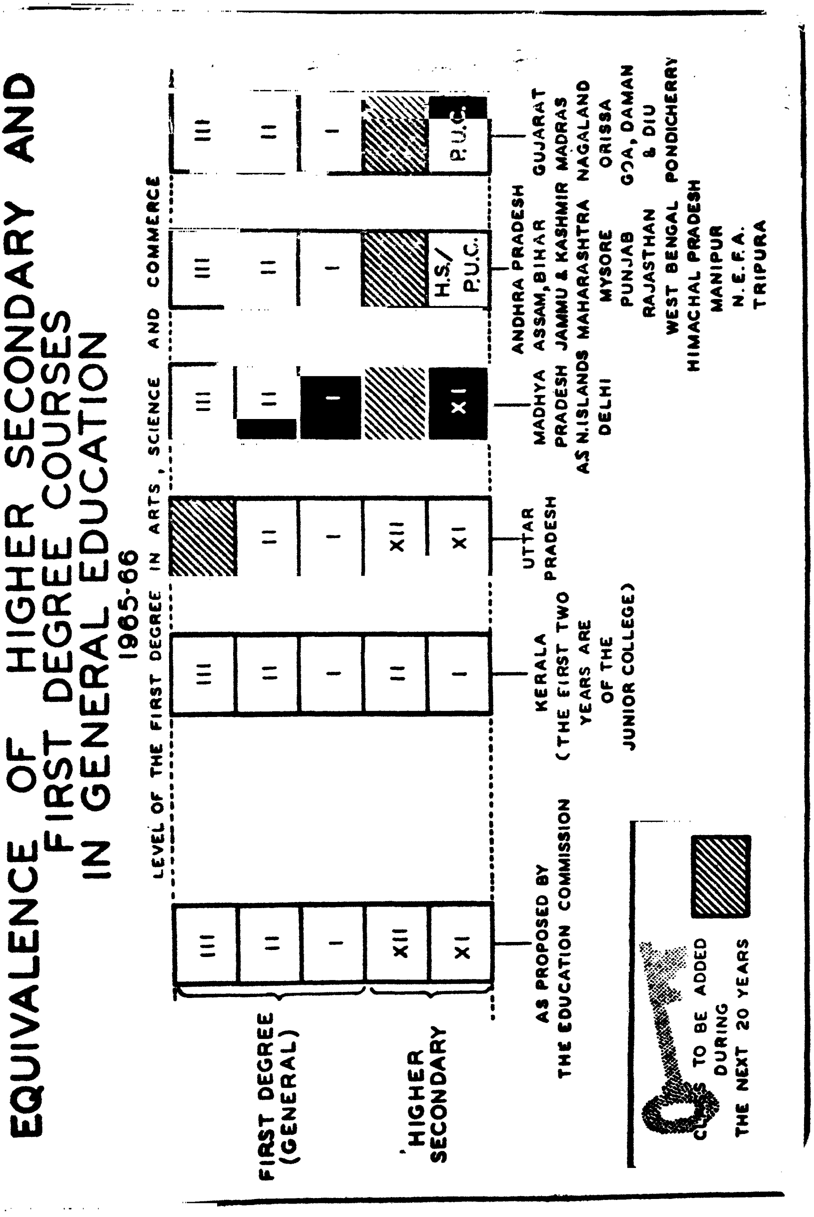
[1] The three year honours courses offered formerly by the universities in U.P. did not prove a success for a variety of reasons, one of them being that the pass course had a duration of two years and admissions to postgraduate courses were open to honours as well as to pass graduates.

[2] Chapters V, XII, XIV and XV.



EQUIVALENCE OF HIGHER SECONDARY AND FIRST DEGREE COURSES IN GENERAL EDUCATION 1965-66

LEVEL OF THE FIRST DEGREE IN ARTS, SCIENCE AND COMMERCE
FIRST DEGREE (GENERAL)
HIGHER SECONDARY
III
II
I
XII
XI
AS PROPOSED BY THE EDUCATION COMMISSION
KERALA (THE FIRST TWO YEARS ARE OF THE JUNIOR COLLEGE)
UTTAR PRADESH
MADHYA PRADESH A.& N. ISLANDS DELHI
H.S./P.U.C.
ANDHRA PRADESH ASSAM, BIHAR JAMMU & KASHMIR MAHARASHTRA MYSORE PUNJAB RAJASTHAN WEST BENGAL HIMACHAL PRADESH MANIPUR N.E.F.A. TRIPURA
P.U.C.
GUJARAT MADRAS NAGALAND ORISSA GOA, DAMAN & DIU PONDICHERRY
▨ CLASS TO BE ADDED DURING THE NEXT 20 YEARS

2.34. It will be generally agreed that the facilities in our educational system, deficient as they are, are not utilized to their full advantage. There is much that can be done to improve standards even in existing circumstances by lengthening the school day, increasing the number of working days, making full use of the long vacations, and generally creating a climate of hard and sustained work. The key to rapid national development is dedication and hard work. Educational institutions should give a lead to society in this matter and create the required climate, in the first instance, in the educational system itself.

2.35. **Working and Instructional Days.** At present, the total number of working days and hours prescribed for educational institutions at all levels is inadequate. What is far worse, a very large proportion of these working days is lost to education for a variety of reasons with the result that the total number of instructional days *i.e.* days which are fully utilized for instructional purposes is often reduced to an absurdly low figure. The details of a study conducted by the Commission to ascertain the number of working days and hours in schools and colleges in different parts of the country (as officially prescribed by the State Education Departments and universities) has been given elsewhere.[1] It shows that there is considerable variation, from area to area, in the total number of working days in a year—these range from 172 to 309 at the school stage and from 120 to 240 at the university stage. The number of holidays given within a school year shows even larger variations—from 20 to 75 at the school stage and from 4 to 49 at the university stage. Similarly, the total duration of vacations varies from 36 to 84 days at the school stage and from 62 to 137 at the university stage. The days utilized for examinations (inclusive of preparatory leave) vary from 10 to 77 and the loss on account of celebrations such as foundation days, annual functions of societies, etc., is sometimes as high as 40 to 60 days in a year. These facts are a sad reflection on the efficiency of the educational system; and the general under-utilization which they represent in a developing economy like ours is tantamount to an unpardonable waste of scarce resources. We, therefore, recommend that the number of instructional days in a year should be increased to about 234 (or 39 weeks) for schools and 216 (or 36 weeks) for colleges (and pre-primary schools).

2.36. **Utilization of Vacations.** In addition, it may be useful to see how this recommendation will be reflected in terms of an academic calendar. For this purpose, we give below a specimen calendar for schools and colleges:

(1) For the *schools*, the calendar will be somewhat like the following:

July 15—Opening day.

(Teachers will attend school one week earlier to make admissions and to prepare plans for the next year).

July 15 to November 30—First working term.

(Not more than one week to be lost in admissions).

December 1 to December 15—First vacation term of two weeks.

December 16 to May 30—Second working term.

Teaching to be over by April 15.

April 16 to April 30—Guided studies by students to prepare for their examinations.

Annual examinations in the first week of May and to be over by the 7th of May (if necessary, the preparatory period may be cut down).

Second week of May—vacation term of one week for students while teachers examine papers

May 15—Declaration of results.

May 16 to May 30—Guidance classes to students for the new year.

June 1 to July 14—Second vacation term of six weeks.

(For students who have failed in the annual examinations, special tutorials to be organized during the vacation term, a re-examination to be held in the second week of July and the students to be promoted to the next class if they pass).

N.B. Some clarification may be given. The idea of vacation terms should be made secular and dissociated from religious festivals like Diwali, Christmas or Puja. The breaks needed for these holidays could be adjusted within the 10 holidays permitted in a year (or with the addition of 3-7 days which could be reduced from the break at the end of the first term).

For the students in Classes X and XII who will take an external examination, the time-table will be slightly different as follows:

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[1] See paper on *Working Hours and Days in Schools and Colleges* included in Supplementary Volume 1, Part V.

July 1 to November 15—First working term.

November 15 to November 22 (one week)—First vacation term.

November 23 to January 31 (Teaching time)—Second working term.

February 1 to February 28—Guided preparation.

March 1 to March 15—Examinations (may also be arranged from February 15 to February 28).

May 30 to June 15—Declaration of results. The time allowed in this arrangement for the declaration of results varies from 1.5 to 3.5 months. There is, however, an urgent need to reduce this time to not more than 2.5 months (from March 15 to May 30) and steps should be taken from this point of view.

(2) For the *colleges and universities*, the time-table will be somewhat on the following lines:

July 15 to November 30—First working term.

December 1 to December 15—First vacation term (2 weeks).

December 16 to April 30—Second working term.

(Examinations to begin after April 1 and to be finished by April 30).

May 1 to July 14—Second vacation term (10 weeks).

(All results to be declared by May 30. For shortening the time, the practice of the IITs of inviting all examiners to a central place may be adopted).

2.37. The calendar given above is merely illustrative, and consultations with the agencies concerned will be necessary before it can be given a final shape. We recommend that this should be done by the Ministry of Education in consultation with the State Governments and by the University Grants Commission with the universities. We realise that, with the large variations in climate, the school calendar will have to vary from area to area. But whatever the calendar adopted, it should be ensured that the minimum number of instructional days should not be less than 234 a year for schools and 216 a year for colleges. This can be done by introducing two reforms:

(1) The first is to cut down other holidays which are now as many as 35 or even more in a year. The general experience is that they serve no useful purpose and merely disturb the work of educational institutions. We recommend, therefore, that these should be drastically cut down to ten (which also includes three days for 'unexpected' events). In our opinion, there is no need to close an educational institution on a religious holiday. Nor is it necessary, for instance, to close it on birthdays or death anniversaries of great Indians; the time could be better utilized in working hard for national development.

(2) The second is to fix an upper limit, in each given year, for the loss of working days to instruction due to all causes including examinations—21 days in schools and 27 in colleges.

2.38. In our opinion, it is desirable to begin the academic year on the same day throughout India. Our discussions with educationists on this issue make us feel that it would be possible to do this if the opening day of the school year were placed in November. We recommend that this idea should be pursued by the Ministry of Education and the University Grants Commission.

2.39. **Utilization of Vacations.** In addition, steps should be taken to ensure that adequate use is made of vacations which are very often wasted. Even in advanced countries, where vacations are already being utilized much better than here, there is a growing feeling that they could be used even more intensively. A country like ours cannot afford to waste vacation time. We would, therefore, prefer to call this period a 'vacation term' rather than a 'vacation' and recommend that all steps should be taken to utilize it fully. This is what teachers actively interested in research do: they use the vacations for pursuing their studies in a manner which it is not possible to follow at term time. A similar practice deserves to be adopted more widely by students as well as by teachers.

2.40. It is quite possible to organize interesting and challenging programmes for students such as

- participation in social service camps, NCC and work-experience;
- earning for maintenance;
- studies for the ensuing year, including general studies, with the help of school and college libraries and laboratories;
- hikes, excursions, tours, cultivation of hobbies; and

— participation in nation-building programmes such as literacy drives.

For these programmes, it will be essential to secure the assistance of a certain proportion of teachers. This could be done by the appointment of additional staff, by the payment of honorarium at prescribed rates to the existing staff, or by granting them compensatory leave in lieu of the vacation lost.

2.41. **School Hours.** It is not enough simply to increase the number of instructional days. For the best results, it is also essential to increase the duration of the working day as indicated below:

(1) At the school stage, the working hours per day should vary from four hours at the pre-primary stage to about six hours at the higher secondary stage. This total period does not include the time for cocurricular activities, but includes the time when the students would be working on their own (*e.g.*, the library period), or on guided studies. In an academic year, the hours of instruction at the lower primary stage should be about 900, and at the higher primary and secondary stages, they should be not less than 1,000, and preferably raised to 1,100 or even 1,200 if conditions are favourable.

(2) At the university stage, the hours of work are already long enough for professional courses (*e.g.*, engineering, medicine, agriculture) and also for science students. It is only the students in the courses in humanities who do not seem to work hard enough. The more serious weakness of the situation, however, is the lack of adequate facilities for students to study on their own. We believe that the 'contact' hours at this stage should be about 15 to 20 a week; but that they should involve the student in working on his own for at least twice as much, so that his total work-load per week is about 50 to 60 hours. As one goes higher up, the contact hours could be less, and self-study periods even longer. At present, students and teachers come together in lectures, where there is hardly any personal contact, and there is no other form in which they can meet. The most urgent reform needed, therefore, is not to lengthen the working day in terms of the lectures delivered—these need to be cut down—but to increase the self-study facilities for students and to ensure that they work adequately. To make it possible, several additional facilities, now lacking in most of our educational institutions, will have to be provided. A well-kept and commodious library with an adequate number of 'reading seats' is necessary; teachers must have rooms, or, lacking this, separate desks of their own at the library; and canteens should be established to provide substantial meals prepared at a reasonable cost under hygienic conditions for students and teachers. Owing mainly to the financial implications involved, it may not be possible to adopt this reform in all institutions. But we feel that a beginning should be made, wherever possible, and the programme should be expanded, on a priority basis, as resources become available.

2.42. **Adequate Utilization of Institutional Facilities.** One more aspect of the problem needs attention. Since it is very costly to provide and maintain the physical plant of educational institutions, it becomes necessary to utilize it as fully as possible, for the longest time on each day and for all the days in the year, by making suitable administrative arrangements. Teachers and students would continue to have their own hours of work and vacations as recommended above. The libraries, laboratories, workshops, craftsheds, etc., should be open all the year round and should be utilized for at least eight hours a day, if not longer. Special vacation programmes should be arranged to utilize institutional facilities for community service, adult education, temporary hostels for day students, enrichment programmes for gifted students and supporting programmes for retarded students. It is not necessary to indicate all the different ways in which the institutional facilities could be utilized all the year round. If an understanding is developed that educational institutions are like temples of learning and should never remain closed, and if a proper climate for sustained work is created, teachers, students and the local communities will themselves discover innumerable methods of utilizing school facilities to the maximum potential throughout the year. When it is difficult to expand educational facilities adequately and a waste to under-utilize existing resources, such programmes demand urgent attention.

DYNAMIC AND EVOLVING STANDARDS

2.43. One of the common criticisms against the development of education in the post-independence period is that there has been a fall in standards, and two main illustrations are given to support it: the increase in the number of sub-standard institutions of general education, and the increase in the number of students with sub-standard attainments. The first of these is far more serious and is largely the cause of the second. We admit that there is considerable force in this criticism and we do not wish to minimize its gravity. But we would not like to ignore the other side of the picture either. It has to be remembered that

- a part of the increase in the number of students with 'sub-standard' attainments is due to the first generation learners, who depress the standards to some extent, but whose entry into secondary schools and colleges in large numbers, especially in rural areas, is also a sign of progress;
- considerable improvements have been made in recent years in the teaching of several subjects;
- good institutions and first-rate students are now more numerous and qualitatively as good as ever, if not better; and
- the total amount of education in society is substantially higher at present than at any time in the past.

The overall situation is thus a mixed picture of light and shade, of improvement as well as deterioration, and rise in standards in some areas accompanied by a comparative decline in others. While we fully support the need and urgency for raising standards, we would also like to recognize the qualitative achievements of the educational system in the last few years. They are a source of inspiration and guidance and can help us to face the task ahead with greater confidence.

2.44. **Criteria for Evaluating Standards.** In our opinion, the basic issue in educational reconstruction is *not* to compare the standards of today with those of the past and to determine whether they are rising or falling. On the other hand, we should judge them on the basis of three inter-related criteria : adequacy, dynamism, and international comparability. Standards must be

- *adequate* in relation to the tasks for which they are intended;
- *dynamic* and keep on rising with the demands for the higher levels of knowledge, skills or character which a modernising society makes; and
- *internationally comparable,* at least in those key sectors where such comparison is important.

Judged on the basis of these criteria, the existing situation appears to be far from satisfactory. Our universities do a good deal of work which really belongs to the secondary school and the latter in its turn does a good deal of work of the primary school. Even where the standards have risen, the rise has not been adequate and better results would have been possible if the existing facilities had been intensively utilized. The main purpose of the first degree should be to bring students to the frontiers of knowledge and to the threshold of the world of research; and that of the second degree to provide a high level of specialization or to initiate the student into research itself. Our first and second degrees in arts, commerce and science do not generally come up to these standards. Moreover, our degrees should be internationally comparable in the sense that those given by our best centres should be as good as those of similar institutions in any part of the world. But by and large, it is our second degree in arts, commerce and science that introduces the student to the world of research and is comparable to the first degree in the educationally advanced countries.

2.45. A lower standard for these degrees was deliberately adopted in the early years of higher education, because universities had to institute a quick first degree in arts and science in order to produce the large number of graduates needed for the expanding administration[1]. The weakness of these degrees was pointed out by the Calcutta University Commission more than forty years ago. But the situation has not materially changed to this day. Meanwhile, advanced countries have made phenomenal progress in education, specially since the second world war. The gap between our standards and theirs has widened further; and the holders of the first degree of our universities in arts and science are now generally equated with matriculates in the important universities of western countries and are eligible for admission only to the first year of their first degree course.

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[1] It is interesting that this proposal of a 'half-way' degree which was adopted in our country about a century ago, is now coming into favour, although for entirely different reasons, in some of the educationally advanced countries. On the continent of Europe, the first degree course (in arts, science and technology) is of about 5 years. In the USA the courses are of 4 years, whereas in the UK the period is 3 years. With rapidly expanding enrolment it is increasingly recognized that there is a need to reduce by about half the duration of some of the undergraduate courses and provide 'half-way' degrees of the Bachelor level. This will serve to screen students going up to the full bachelor's degree; and will help in maintaining and raising the standard of the full degree. (OECD Ministerial Meeting in Science : *Fundamental Research and the Policies of Government*, Paris, 1966).

2.46. **Recommendations.** We recommend that an intensive effort should be made, through measures for reorganization of the structure, increase of duration, intensive utilization and improvement of the quality and extent of inputs other than time, to raise standards continually at all stages of education. The immediate programmes to be undertaken from this point of view should be the following:

(1) *Standards at the End of the First Stage of School Education.* The standards reached at the end of the first ten years of school education at present are far from satisfactory. We, therefore, recommend that for the next ten years the principal effort in all the States and Union Territories should be directed towards the qualitative improvement of this stage of school education so that its wastage—which reaches appalling dimensions at present—is reduced to the minimum. Our proposals on this subject are discussed in detail elsewhere.[1] With a substantial reduction in wastage and with better inputs in terms of teachers, curricula, methods of teaching and evaluation, and facilities, we believe it is possible to raise within a decade or so the existing standard at the end of Class X to the standard now being attained on the completion of the higher secondary course. In other words, the schools will add, not one year of time, but one year of content, and achieve in a period of ten years what is now being done in eleven.

(2) *Standards at the University Stage.* Beyond Class X, we have proposed the addition of at least one year of time. If we intensify utilization and improve other inputs, it may be possible to add a year of content to this stage also. The total gain would thus be equal to two years of content and this would raise the standards of our degrees considerably. When the standard at the end of the first stage of school education is raised by one year of content, the standards of our degrees will rise even higher. Against this background, with the adoption of the programme of developing a few major universities which we shall discuss elsewhere[2], we could make the standards of some of our universities comparable to the best institutions of their type in any part of the world.

2.47. We have referred earlier to the popular misconception that it is essential to have a uniform pattern of school and higher education in order to improve or maintain standards. But while we are opposed to uniformity of pattern, we do very much share the general concern over the necessity for a continual improvement of standards and their comparability between different parts of the country. In our opinion, this objective can be better secured at the school stage through the creation of an adequate and efficient machinery at the State and the national levels, for defining, revising and evaluating national standards at the end of the primary, high school and the higher secondary stages. We shall discuss these problems in detail in a later part of the Report[3].

2.48. **Proper Articulation between the Different Stages of Education.** Still another way in which standards can be raised is by securing better coordination between the different stages of education and by making the educational institutions function in small groups instead of in isolation. At present, there is little practical coordination between educational institutions functioning at different levels of education. The people at the university stage criticize those at the secondary stage for a fall in standards; and those at the secondary stage pass the blame on to the persons at the primary stage. This situation of mutual recrimination has to be changed into one of mutual help, and this can be done by making each higher stage of education take the responsibility for improving standards at the lower stages.

2.49. **The Role of Universities and Colleges.** The universities and colleges for example, should assist the secondary schools in improving their efficiency. The following are some of the programmes which can be undertaken:

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[1] Chapter VII.

[2] Chapter XI.

[3] Chapter X.

- Each college can be functionally related to a number of secondary schools in the neighbourhood and enabled to provide extension services and guidance to them to improve their standards. A similar programme for the colleges themselves could be developed through the universities.
- The universities can conduct special diploma courses, either pre-service or in-service, for improving the competence of secondary teachers. These can preferably be correspondence courses, requiring only short-term personal attendance.
- The universities can conduct experimental secondary or primary schools to evolve improved techniques of teaching and organization.
- The university and college teachers can take upon themselves the responsibility for improving school textbooks and providing better types of instructional materials.
- The universities and colleges could select talented students from the schools in different subjects at an appropriate stage, say, in the age-group 13-15, and help them to develop their knowledge in special fields through individual guidance, provision of laboratory facilities, etc., over and above regular school work.

These programmes have been cited merely as illustrations. Once the principle that the universities should assist in the improvement of standards at lower stages is accepted, it will be possible to devise many other programmes.

2.50. **The School Complex.** What was stated above for the relationship between universities, colleges and secondary schools, could be easily extended further to secondary and primary schools. There are about 26,000 secondary schools at the beginning of the fourth plan and about 14,000 of these are in rural areas. In addition, the rural areas have about 65,000 higher primary schools and about 360,000 lower primary schools. In other words, in a rural area having a radius of five to ten miles, there will be about one secondary school, five higher primary schools and 28 lower primary schools. The total number of teachers may be about 80 to 100. This is a fairly small and manageable group which can function in a face-to-face relationship within easily accessible distance. It has also a good potential for planning and guidance, since there will be at least five or six trained graduates in the group. Moreover, it is possible to provide new aids like a projector, a good library, a good laboratory in each secondary school as a unit and make them functionally available to all the schools in the area. This group built round a secondary school should, in our opinion, be adopted as the minimum viable unit of educational reform and developed accordingly.

2.51. The linking of secondary and primary schools under this programme can be done in two tiers. In the first tier, each higher primary school should be integrally related to the eight to ten lower primary schools that exist in its neighbourhood so that they form one 'complex' of educational facilities. The headmaster of the higher primary school should provide an extension service to the lower primary schools in his charge, and it will be his responsibility to see that they function properly. For this purpose, there would be a committee under his chairmanship (of which the headmaster of every lower primary school in his area would be a member) which would be responsible for planning and developing all the schools as a single 'complex'. The second tier would be a committee under the chairmanship of the headmaster of the secondary school (all headmasters of the higher and lower primary schools in the area being members) which will plan the work and give guidance to all the schools in the area in the light of which each higher primary school complex (with its associated lower primary schools) would carry on its work. This group of schools and teachers can be given a good deal of freedom to develop their own programmes, subject to general guidance of the inspecting staff. It should also be requested to coordinate its work with the local communities and to derive as much help from this source as possible.

2.52. Such an organization will have several advantages in helping to promote educational advance. It will break the terrible isolation under which each school functions at present. It will enable a small group of schools working in a neighbourhood to make a cooperative effort to improve standards.

It will enable the Education Department to devolve authority with comparatively less fear of its being misused and provide the necessary stock of talent at the functional level to make use of this freedom.

GENERAL

2.53. **Three Channels of Education.** One of the major weaknesses of the existing educational system is that it places an almost exclusive reliance on full-time instruction and does not develop adequately the two alternative channels of part-time education and private study or own-time education. It has to be remembered that reliance on full-time education as the sole channel of instruction often divides the life of an individual into three water-tight and sharply divided stages: a pre-school stage of no formal education or work, a school stage of full-time education and no work, and a post-school stage of full-time work and no education. In a modernizing and rapidly changing society, *education should be regarded, not as a terminal but as a life-long process. It should begin informally in the home itself*; and thereafter, it should be the ultimate objective of national policy to strive to bring every individual under the influence of the formal system of education as early as possible, and to keep him under it, directly or indirectly, throughout his life. Similarly, there should be no water-tight separation between work and education at any stage of a man's life, but only a relative shift of emphasis. An individual under full-time education should have some work-experience as an integral part of his education itself; and every full-time worker should have the inclination, leisure and means of continuing his education still further. In the same way, the transition from one stage to another should not be abrupt. For example, the transfer of an individual from the infant's play-dominated world to formal school should include a transitional phase of gentle preparation and orientation to schooling. A young person should not be compelled to pass abruptly from a stage of full-time education to another of full-time work; it would be desirable to interpose a period of part-time education and part-time work between the two.

2.54. If these objectives are to be attained, it is necessary to abandon the present policy of placing an almost exclusive reliance on full-time education, and the two alternative channels of part-time and own-time education should be developed on a larger scale at every stage and in every sector of education and should be given the same status as full-time education. Secondly, adult and continuing education, which is almost totally neglected at present, should be emphasized to a very great extent. Taken together, these two reforms would

— enable those who have not completed a stage of education to complete it and, if they wish, to proceed to the next;

— help every educated person to have further education with or without formally enrolling himself in an educational institution;

— enable a worker to acquire knowledge, ability and vocational skill in order to be a better worker and to improve his chances of earning more; and

— help to refresh the knowledge of the educated person and enable him to keep pace with the new knowledge in the field of his interest.

Programmes of this type, which are being developed even in educationally advanced and affluent countries, cannot be ignored in an under-developed and poor country like India. They will smoothen the transition from school to life, reduce the cost of education to the State, and bring under the influence of the educational system a large number of persons who desire to educate themselves but cannot do so on economic grounds.

2.55. **Nomenclature.** At present, there is an almost bewildering variety of nomenclatures used in the States and Union Territories to denote the various stages and sub-stages of education. We realize the need for a uniform system of nomenclatures and recommend that it should be evolved by the Government of India, in consultation with the State Governments. Pending the finalization of such a system, we have used the nomenclatures shown on page 45 througout the Report.

EXISTING AND PROPOSED NOMENCLATURES FOR VARIOUS STAGES OF EDUCATION

Nomenclatures Proposed	*Existing Nomenclatures*
SCHOOL EDUCATION	
1. Pre-primary	1 Pre-primary 2 Pre-basic 3 Kindergarten 4 Montessori, etc.
2 Primary (Classes I-VII or I-VIII)	
(a) *Lower Primary* Classes I-IV or I-V	1 Primary in some States (*e.g.* Punjab) 2 Lower Primary in some States (*e.g.* Gujarat) 3 Junior Basic 4 Lower Elementary in some States (*e.g.* Madras)
(b) *Higher Primary* Classes V-VII or VI-VIII	1 Middle in some States (*e.g.* Punjab) 2 Junior High School (*e.g.* U.P.) 3 Upper Primary in some States (*e.g.* Gujarat) 4 Senior Basic 5 Higher Elementary in some States (*e.g.* Madras)
3 Secondary Classes VIII-XII or IX-XII	High School; Higher Secondary School.
(a) *Lower Secondary Education* Classes VIII-X or IX-X	High School
(b) *Higher Secondary Education* Classes XI-XII	This will include Class XI or PUC in some States (*e.g.* Rajasthan). It will include Junior Colleges in Kerala. It will include Intermediate Classes in Uttar Pradesh. It will also include terms like pre-professional, pre-medical and pre-engineering.
HIGHER EDUCATION	
4. *Professional Degrees*	All degrees which lead to a professional qualification (*e.g.* M.A.; M.Sc.; M. Com.; B.E.; M.B. B.S.; B.T.; LL.B.; B. Ag., etc.)
5. *General Degrees*	All degrees other than professional ones.
6. *Undergraduate*	All courses leading to the first degree.
7. *Postgraduate*	All courses beyond the first degree (excluding certain first degrees given after the first degree *e.g.* B.Ed.)
GENERAL	
First Level of Education	This will include pre-school and primary education.
Second Level of Education	This will include high school and higher secondary education.
Third Level of Education	This will include undergraduate and postgraduate education and research.

CHAPTER III

TEACHER STATUS

I. *Remuneration.* (3) Developments in the post-independence period; (7) National scales of pay; (9) Principle of parity; (10) General principles for revision of salaries; (11) Recommendations on salaries of teachers; (12) Some specific proposals for reform at the university stage; (14) School stage—simplification of pay scales; (16) Scales of pay of teachers who have completed the secondary course; (17) Scales of pay of teachers in secondary schools; (19) Recruitment of school teachers; (20) Promotional prospects; (21) Relating salaries to costs of living; (22) Welfare services; (24) Financial implications; (28) Urgency of the problem and need for Central assistance.

II. *Retirement Benefits.* (29) Principle of uniformity; (30) Retirement benefits for school teachers—interim measures; (31) Retirement benefits for teachers in higher education—interim measures.

III. *Conditions of work and service.* (33) Conditions of work; (34) Parity in the terms and conditions of service; (36) Residential accommodation; (38) Additional earnings; (39) Civic rights; (40) Women teachers; (43) Teachers for tribal areas; (44) Teachers' organizations; (46) Joint teachers' councils; (47) Social status and morale; (48) National awards for school teachers.

3.01. Of all the different factors which influence the quality of education and its contribution to national development, the quality, competence and character of teachers are undoubtedly the most significant. Nothing is more important than securing a sufficient supply of high quality recruits to the teaching profession, providing them with the best possible professional preparation and creating satisfactory conditions of work in which they can be fully effective. In view of the rapid expansion of educational facilities expected during the next three plans, and specially in view of the urgent need to raise standards to the highest level and to keep them continually improving, these problems have now acquired unprecedented importance and urgency.

3.02. A programme of high priority in the proposed educational reconstruction, therefore, is to feed back a significant proportion of the talented men and women from schools and colleges into the educational system. For this purpose, it is necessary to make an intensive and continuous effort to raise the economic, social and professional status of teachers in order to attract young men and women of ability to the profession, and to retain them in it as dedicated, enthusiastic and contented workers. This can be done, to a very limited extent only, through appealing to motives such as love of children or of teaching, interest in academic work or research, idealism and desire for social service, which attract a small proportion of able young persons to the teaching profession. There can, however, be no doubt that the provision of adequate remuneration, opportunities for professional advancement, and favourable conditions of service and work, are the major programmes which will help to initiate and maintain this 'feed-back' process. We propose to discuss some important aspects of these programmes in the course of this chapter and the next.

REMUNERATION

3.03. **Developments in the Post-Independence Period.** In the post-independence period, continuous efforts have been made to improve the remuneration of teachers at all levels and schemes for this purpose have figured prominently in all the plans. But the net results achieved have not been adequate, particularly in respect of primary school teachers. This will be seen from Table 3.1.

TABLE 3.1. AVERAGE ANNUAL SALARIES OF TEACHERS IN INDIA (1950-51 to 1965-66)

Type of institutions	Average annual salary of teachers (at current prices) in				Average annual salary in 1965-66 at 1950-51 prices
	1950-51	1955-56	1960-61	1965-66	
A. Higher Education					
1. University departments	3,759 (100)	5,456 (145)	5,475 (146)	6,500 (173)	3,939 (105)
2. Colleges of arts and science	2,696 (100)	3,070 (114)	3,659 (136)	4,000 (148)	2,424 (90)
3. Professional colleges	3,948 (100)	3,861 (98)	4,237 (107)	6,410 (162)	3,885 (98
B. Schools					
4. Secondary schools	1,258 (100)	1,427 (113)	1,681 (134)	1,959 (156)	1,187 (94)
5. Higher primary schools	682 (100)	809 (119)	1,058 (155)	1,228 (180)	741 (109)
6. Lower primary schools	545 (100)	652 (120)	873 (160)	1,046 (192)	634 (116)
7. Pre-primary schools	914 (100)	770 (84)	925 (101)	1,083 (118)	(656) (72)
8. Vocational schools	1,705 (100)	1,569 (92)	2,041 (120)	2,887 (169)	1,750 (103)
ALL TEACHERS	769 (100)	919 (120)	1,218 (158)	1,476 (192)	895 (116)
9. Cost of living index for working classes	100	95	123	165	
10. National income per head of population (at current prices)	267 (100)	255 (96)	326 (122)	424 (159)	

Source. Ministry of Education, Form A. The figures for 1965-66 are estimates made in the Commission Secretariat.

N.B. The figures within brackets give the index of growth on the basis of 1950-51 = 100.

3.04. It will be seen that the increase in the remuneration of the different categories of teachers is far from uniform. The largest proportional increase has taken place in the salaries of teachers in primary schools. But owing to the very low levels of remuneration which obtained in 1950-51, these are still far from satisfactory. The improvement in the salaries of teachers in the universities, vocational schools and colleges is also noticeable. But in the colleges of arts and science and in secondary schools, there has been an actual decrease in remuneration in real terms. The picture is worst at the pre-primary stage because the salaries in pre-primary schools are governed, not so much by departmental regulations, as by market conditions. This is because most of the pre-school institutions are unaided and located in urban areas where an over-abundant supply of women teachers is available.

3.05. It will also be noted that a good deal of the effect of the increase in remuneration at all stages has been offset by the rise in the cost of living which has taken place during this period—the remunerations in the various types of institutions have risen by 18 to 92 per cent while the cost of living has risen by 65 per cent. It is only in four types of institutions—vocational schools (69 per cent), universities (73 per cent), higher primary schools (80 per cent) and lower primary schools (92 per cent) that the rise in remuneration has exceeded that in the cost of the living. In some sectors, *e.g.*, pre-primary, the increase in the cost of living has been greater than that in remuneration. On the whole, there was some improvement in the remuneration of teachers in real terms up to 1960-61. This has since been almost completely neutralized by the sharp increase in prices that has taken place in the last two or three years. This has, we are afraid, adversely affected the morale of teachers. In our opinion, the most urgent need is to upgrade the remuneration of teachers substantially, particularly at the school stage.

3.06. The Commission made a study of the remuneration of teachers in all the States and Union Territories.[1] It revealed two major weaknesses:

(1) *Inter-State Differences*. There are substantial differences in the remuneration of teachers from State to State, particularly at the school stage; and

(2) *Intra-State Differences*. Even within a State, there are variations in remuneration. At the university stage, salaries vary from faculty to faculty. The teachers in affiliated colleges do not have the same scales of pay as those in universities. At the school stage, there are often substantial differences in the remuneration of teachers working in institutions under different managements.

There has been a strong demand for the abolition of these variations. It has been suggested that the first type of variation can be eliminated or reduced to the minimum by adopting national scales of pay with adjustment in allowances for inevitable local variations in the cost of living and that the second should be offset by adopting the principle of parity. Both these proposals need a closer examination.

3.07. **National Scales of Pay.** The demand for the introduction of national scales of pay for all categories of teachers is supported unanimously by teachers' organizations. We found that the proposal had a ready acceptance in higher education because of the developments in the post-independence period. The University Education Commission recommended that the multiplicity of scales of pay which then existed in the universities and colleges should be reduced to the minimum and that an attempt should be made to adopt national scales of pay for teachers in higher education. This recommendation was broadly accepted and some action to implement it has since been taken. The UGC is attempting to introduce common scales of pay for different categories of teachers in the universities and similar scales of pay for teachers in affiliated colleges. Attempts for the introduction of common scales of pay are also being made, with a fair amount of success, in respect of engineering institutions. It is true that, in spite of all that has been done during the last ten years, there are still considerable variations in the scales of pay of teachers in higher education. But the important point is that the general principle of adopting national scales of pay has been broadly accepted; and all that is needed is to make a more determined effort to move forward on the lines already set. This is a comparatively simpler issue.

3.08. At the school stage, however, the problem is more difficult because the desirability of introducing national scales of pay at this stage is itself challenged. It is argued, for instance, that as the cost of living varies from one part of the country to another, a common national scale of pay would really imply unequal payment and cause considerable hardship to school teachers with lower levels of income. It is also pointed out that the supply and demand position for the different categories of teachers varies considerably from one part of the country to another. Women teachers, for instance, are readily available in some areas and are very difficult to obtain in others. Under these circumstances, it is pointed out that a common scale of pay would make it more difficult to recruit them in just those areas where they are most needed. There is some force in these arguments. But in our opinion, they only make out a case for providing local allowances in addition to basic national scales of pay rather than disprove the need to adopt minimum national scales of pay to reduce the large disparities that now exist in the salaries of school teachers in different States. We, therefore, recommend that, at the school stage, the Government of India, should lay down the minimum scales of pay for school teachers. The States and Union Territories should then adopt equivalent or higher scales of pay to suit their local conditions.

3.09. **Principle of Parity.** With regard to the intra-State differences, we recommend that the remuneration of teachers working under different managements should also be the same and that all teachers having the same qualifications and the same responsibilities should have the same, or at least similar, remuneration and conditions of work and service. The problem will have to be discussed separately for higher and school education.

(1) *Higher Education*. There is a good deal of disparity in the remuneration of

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[1] For details, see Supplementary Volume I. Part IV.

teachers of different categories in higher education. For instance, the remuneration of teachers in different faculties is not the same: the teachers in the faculties of engineering and medicine are paid higher than those in the humanities. There is also a difference in most parts of the country, between the salaries given to teachers in universities and those given to teachers in affiliated colleges. In many States, teachers in government colleges do not get the scales of pay given to university teachers, although their remuneration is often much better than that of teachers in affiliated colleges. We recommend that these differences should be reduced to the minimum and efforts made to eliminate them gradually.

(2) *School Teachers.* We recommend that the scales of pay of school teachers belonging to the same category but working under different managements such as government, local bodies or private organizations, should be the same. The existing variations are purely historical in origin. The administrative authorities under the British did not wish to reduce the salaries of government servants; at the same time, they were anxious to keep salary costs down to a level which the economy could afford. Hence the salaries of teachers in local authority schools were deliberately fixed at a point lower than that for government teachers and those for teachers in private schools were fixed at a still lower point. This policy has had two unfortunate results: it has lowered the average wage for teachers in general, as teachers in government service were a very small minority; it has also introduced an undesirable 'caste' system among them. It is time to eliminate these relics of the past.

We are happy to note that a move in this direction has already been initiated and is well on the way. The principle of parity has been accepted at all levels of school education in seven States (Andhra Pradesh, Kerala, Madhya Pradesh, Madras, Mysore, Punjab and Rajasthan). In three States (Assam, Gujarat and Maharashtra) it has been accepted at the primary level, but not at the secondary for all categories of teachers. In five States (Bihar, Jammu and Kashmir, Orissa, Uttar Pradesh and West Bengal) it has not been accepted at any stage and the scales of pay prescribed for teachers in non-government schools are different and much lower. Some illustrations of this are given below:

State and category of teachers	Government institutions	Non-government institutions
Assam		
1. Principal of a higher secondary school	Rs. 350—1000 (starting salary of Rs. 450).	Rs. 250—600 (starting salary of Rs. 390).
2. Assistant teacher in high school trained graduate . .	Rs. 250—700	Rs. 125—275 (starting salary of Rs. 140).
Bihar		
Matriculate trained teacher in a primary school	Rs. 115—200 (D.A. Rs. 5).	Rs. 50—90 (D.A. Rs. 30).
Orissa		
Assistant teacher (trained graduate) in a secondary school . .	Rs. 185—325	Rs. 175—300
West Bengal		
1. Headmaster of a secondary school	Rs. 325—1000	Rs. 350—525
2. Assistant teacher in a secondary school with M.A./M.Sc./M. Com. & B.T.	Rs. 225—475	Rs. 210—450
3. Assistant teacher in a secondary school with B.A. B.Sc. & B.T. .	Rs. 175—325	Rs. 160—295

It will be seen that, in some cases, the differences are marginal while in others, they are serious and glaring.

Three main arguments are put forward for retaining this disparity in remuneration. The first is that the teachers in non-government schools are not well-qualified and not properly selected. We cannot accept this contention. Instead of perpetuating unequal remuneration on these grounds, it is essential to adopt the principle of parity in remuneration, and simultaneously to prescribe the same qualifications for teachers in all types of schools and to introduce a similar machinery for their recruitment.

The second is that teachers in government service have certain handicaps such as liability to transfer, application of conduct and discipline rules, etc., and that parity in remuneration would tilt the balance materially in favour of teachers in private schools. We do not agree with this view either. We are opposed to the idea of frequent transfers in government schools and have recommended that their teachers should, as far as possible, be localized. We do not support the restrictions on the academic freedom of teachers in government educational institutions and instead of compensating them for it in monetary terms, we have recommended the grant of academic freedom. There are bound to be some differences in conditions of service in government and non-government institutions. For instance, private educational institutions can provide a more satisfying experience to certain persons while teachers in government schools have better prospects of promotion. But in the proposals formulated by us, these differences have been reduced to the minimum and there is, therefore, no justification to continue the existing disparity of remuneration. The third argument put forward is financial and it is said that the funds needed to upgrade the salaries of teachers in local authority and private schools to the level of those in government schools are not readily available. We recognize the force of this argument and recommend that the principle of parity should be accepted as a State policy forthwith but that its full implementation should be spread over a phased programme of about five years.

3.10. **General Principles for Revision of Salaries.** In making our proposals for the revision of the remuneration of teachers, we have kept the following principles in view:

(1) At the university stage, the remuneration of teachers should be broadly comparable with that of the senior services of the Government so that a fair proportion of the top talent in the country is attracted to the profession of teaching and research. What is important here is that the salary of a vice-chancellor should be about the same as that of a Secretary to the Union Government; the maximum salary of a university professor should be the same as the maximum in the senior scale of the IAS; and for outstanding professors, higher salaries comparable to super-time scales of pay of the IAS should be available.

(2) The scales of pay of primary teachers should be comparable to those of public servants with similar qualifications and responsibilities. But they should have a higher basic pay in recognition of the two years of professional training which they have received.

(3) Since teaching is a unified profession, requiring common attitudes of devotion and dedication and since teachers at every stage are entrusted with the responsibility of educating the younger generation, the differences in the remuneration of the teachers at the different levels —primary, secondary and university —should be reduced to the minimum. For example, the minimum salaries of primary, secondary and university teachers should be in the ratio of 1:2:3. At present, the starting salary of a primary teacher can be as low as Rs. 60—30, which is about one-twelfth to one-sixteenth of the starting salary of a professor.

(4) In order to induce better qualified teachers to teach at the lower stages —the raising of educational standards will ultimately depend upon this—it is essential to adopt a policy under which the scales of pay of teachers at the school stage will be based only on qualifications and be made independent of the sub-stage—pre-primary, lower primary, higher primary, lower secondary or higher secondary—in which they might be serving. While we accept this idea in principle, it may not be possible, on financial grounds, to adopt it immediately *in toto*. We have, however, taken the view that at least the headmasters of all large lower primary schools (say, with an enrolment of about 200) and of all higher primary schools, should be trained graduates and should have the same scale of pay as that of trained graduate teachers in secondary schools. Similarly, a certain proportion of the teachers at the secondary stage should have the same qualifications and the same scales of pay as junior lecturers in affiliated colleges.

(5) The improvement in salary scales should not be entirely automatic:

it should be linked with the improvement in qualifications and quality.

3.11. Recommendations on Salaries of Teachers. In the light of these general principles, we propose the following scales of pay:

Teachers	Remuneration	Rs.
(1) Teachers who have completed the secondary course and have received two years of professional training	Minimum for trained teacher	150
	Maximum salary (to be reached in a period of about 20 years)	250
	Selection grade (for about 15 per cent of the cadre) .	250—300

N.B. The minimum salary of a primary teacher who has completed the secondary course should be immediately raised to Rs. 100; and in a period of five years, it should be raised to Rs. 125. Similarly, the minimum pay of a teacher, who has received two years of training, should be raised immediately to Rs. 125; and it should be raised to Rs. 150 in a period of five years. Untrained persons with the requisite academic qualifications should work on the starting salary until they are trained and become eligible for the scale.

Teachers	Remuneration	Rs.
(2) Graduates who have received one year professional training	Minimum for trained graduate	220
	Maximum salary (to be reached in a period of 20 years)	400
	Selection grade (for about 15 per cent of the cadre)	400—500

N.B. Untrained graduates should remain on their starting salary of Rs. 200 p.m. until they are trained and become eligible for the scale.

Teachers	Remuneration	Rs.
(3) Teachers working in secondary schools and having postgraduate qualifications		300—600

N.B. On being trained, they should get one additional increment.

Teachers	Remuneration		
(4) Heads of secondary schools	Depending upon the size and quality of the school and also on their qualifications, the headmasters should have one or other of the scales of pay for teachers in affiliated colleges recommended below.		
(5) Teachers in affiliated colleges	Lecturer—	Junior scale	Rs. 300—25—600
		Senior scale	Rs. 400—30—640—40—800
	Senior Lecturer/Reader		Rs. 700—40—1100
	Principal	I	Rs. 700—40—1100
		II	Rs. 800—50—1250
		III	Rs. 1000—50—1500

N.B. The proportion of lecturers in the senior scale to those in the junior scale should be progressively improved. By the end of the fifth plan, this proportion should be raised to about 75 % on an average.

Teachers	Remuneration	
(6) Teachers in university departments	Lecturer	Rs. 400—40—800—50—950
	Reader	Rs. 700—50—1250
	Professor	Rs. 1100—50—1300—60—1600

N.B. (1) The proportion of junior to senior posts (*i.e.* Readers/Professors) is about 3:1 at present in the universities (the corresponding ratio for affiliated colleges is 5:1). We should gradually move in the direction of raising it to 2:1.

(2) One-third of the professors should be in the senior scale of Rs. 1600—1800. Special scales should be introduced for exceptionally meritorious persons and in selected Centres of Advanced Studies.

Note:

(a) The above scales of pay for school teachers are at the current price level and include the existing dearness allowance. Suitable increases will, however, have to be made for rise in prices from time to time. For this purpose, there should be parity in dearness allowance, i.e., the dearness allowance in any given year should be the same as it is paid to government servants drawing the same salary.

(b) All scales of pay should be periodically reviewed and revised at least once in five years.

(c) Compensatory cost of living allowance given in cities, house-rent allowance or other allowances are *not* included. These will be in addition to the salary recommended above and should be given on a basis of parity.

(d) The scales of pay are to be integrally related to the programmes of qualitative improvement of teachers through improved methods of selection, and improvement in general and professional education.

(e) The scales are to be given to all teachers—government, local authority or private.

We shall now turn to a discussion of these scales in some detail.

3.12. **Some Specific Proposals for Reform at the University Stage.** As a result of the recommendations of the University Education Commission and the work done by the UGC during the last ten years, considerable improvement has been made in regard to the scales of pay of teachers at the university stage. The multiplicity of scales which existed in the past has been reduced and the new scales adopted are more comparable to those in the senior administrative services of the Government of India. National scales of pay have been suggested for teachers in universities and in affiliated colleges and these are being increasingly adopted by the institutions concerned. We also welcome the recent decision of the Government of India, on the recommendation of the UGC, to sanction the new scales of pay for university teachers which have been indicated above. The main points to be considered in this context, therefore, are two: (a) implementation of these proposals: and (b) relating them to improvement in quality and qualifications of teachers.

3.13. To facilitate the introduction of these scales at an early date, and especially in private institutions which are so numerous, we recommend that assistance from the Centre be provided to meet the additional expenditure on a sharing basis of 80 per cent from the Central funds and 20 per cent by the State Government and that, in the case of private colleges, the Central assistance may even be provided on a 100 per cent basis. Such assistance should continue during the fourth plan period; and, in the meanwhile, steps may be taken by the State Governments to devise an appropriate system of grant-in-aid for placing the revised scales on a permanent basis. Our proposals on this subject have been discussed elsewhere.[1]

(1) *Teachers in Universities.* In regard to the qualifications and selection procedures for university teachers, we agree with the recommendations made by the Model Act Committee which we quote for ready reference:

> The standard and quality of work of a university depends very largely on the quality of its teachers. It is most important that every care is exercised by the authorities concerned so that teachers of the highest competency are recruited by the universities. Also the conditions of service and opportunities for professional advancement should be such as would attract and retain in the service of the universities men of outstanding ability. The power to appoint teachers must be vested in the Executive Council, but all the teaching appointments should be made by the Executive Council only on the recommendation of a properly constituted Selection Committee. The Selection Committee should consist, besides the Vice-Chancellor and the Head of the Department concerned, of a certain number of experts. This number may vary in accordance with the category of teachers to be appointed. For a professor, it should be necessary to have two or even three outside experts. It may be an advantage to have one nominee of the Chancellor/Visitor on the Selection Committee. The Court or the Academic Council should not select a representative to the Selection Committee. It should be a clear rule that the Executive Council should accept the selection unanimously recommended by the Selection Committee. In rare cases, if for good reasons the Executive Council is unable to accept the recommendation of the Selection Committee efforts for a better selection may be renewed in the following year. A great deal of what is described as university politics or interference of outside politics in universities arises in connection with appointments. Universities must have the freedom to make their own appointments; but they must be steadfast in their desire to make right appointments.[2]

(2) Our attention has been drawn to the fact that, in most universities, candidates for appointment as professors are called for interview before a selection committee. Each candidate is interviewed by the committee for 10 to 15 minutes. We are definitely of the view, that in the case of such high level appointments, interviews have hardly any meaning, and in fact, tend to discourage first-rate men from offering for such appointments. Professors should be persons of standing in the subjects and should be known to the experts by reputation in the fields of their work. It should, therefore, be possible for a selection committee to make a selection on the basis of a careful consideration of the information supplied by the candidates and other relevant data which may be available to the committee. If considered necessary, candidates who have been found suitable for appointment by the selection committee

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[1] Chapter XIII.

[2] *Report of the Committee on Model Act for Universities*, Ministry of Education, Government of India, 1964, pp. 23-4

may be invited by the vice-chancellor for a personal discussion before making a formal offer of appointment.

(3) *Teachers in Affiliated Colleges.* The procedure described above will also apply to university colleges. Problems do not generally arise with regard to government colleges where recruitment is done through a Public Service Commission. In private affiliated colleges, however, the situation needs considerable improvement on the following lines:

(a) The qualifications of teachers in these colleges should be prescribed by the universities and should be similar to those prescribed in university departments.

(b) Each post should be advertised and selection committees should be formed on the lines recommended above for the universities.

(c) On the advice of the selection committee, the appointment should be made by the managing committee constituted for the college. As recommended by the Model Act Committee, this managing committee should be a compact body consisting of about 10 members. The composition of this body should be prescribed by the university. The principal of the college should be a member of this body and in addition there should be provision for one or more teachers to be on it, preferably by some method of rotation rather than by election. The university should nominate to the governing body two representatives who should normally be teachers of experience.[1]

(d) If any exemption is to be given at all from the possession of the prescribed qualifications, it should not be for more than a year or two. Even when circumstances demand that the exemption should last for a longer period, such exemption given for a temporary period should not lapse into permanent exemption. It is unfair to admit students to a course unless there are qualified teachers.[2]

(e) While the right to make appointments should vest in the colleges, it should be open to the university to withhold 'recognition' of colleges, if persons with high qualifications are rejected without adequate reasons and others with lower qualifications, even though satisfying the minimum requirements, are appointed. In some of these cases this happens because the institution is, either openly or without avowing it, a narrowly denominational institution. In other cases it may just be a case of improper exercise of patronage by the managing body or it may be due to extraneous pressures.[3]

(f) We further recommend that it would be desirable to adopt a discriminating approach between one private management and another. Where good standards are maintained and the management has shown its competence to conduct the institution satisfactorily, greater freedom should be given to it in the choice of its teachers. Where the management is not satisfactory, greater control should be exercised.

3.14. **School Stage: Simplification of Pay Scales.** As compared to higher education the problem of improving the remuneration of teachers at the school stage is more complex and difficult. It is also far more urgent. This urgency has increased because Government has recently sanctioned new scales of pay for teachers in higher education and thus increased the gap, which was already large, between their salaries and those of the school teachers.

3.15. Our first proposal is that the existing multiplicity of scales of pay should be reduced and that there should be three main scales of pay for school teachers:

(1) A scale of pay for teachers who have completed the secondary course and are trained and who would form the vast bulk of teachers at the primary stage;

(2) A scale of pay for trained graduates who would form a small proportion of teachers at the primary stage but the vast bulk of teachers at the lower secondary stage;

(3) A scale of pay for teachers with postgraduate qualifications who would form a small proportion of teachers at the lower secondary stage, but the bulk of teachers at the higher secondary stage.

Incentives to teachers of special subjects or to teachers with additional qualifications can be given in the form of advance increments or special allowance. The scales of pay of special teachers, (*i.e.* for drawing, craft, physical education, etc.) can also be related to these three basic scales in some suitable manner. The scales of pay for librarians should also be related to those for teachers in a suitable manner.

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[1] *Report of the Committee on Model Act for Universities,* Ministry of Education, Government of India, 1964, p. 28.

[2] *Ibid* p. 28

[3] *Ibid* p. 28

3.16. Scales of Pay of Teachers who have Completed the Secondary Course. With regard to this category of teachers, we make the following recommendations:

(1) There should be no teacher at the primary stage who has not completed the secondary school course and has not had two years of professional education[1].

(2) In so far as teachers who have completed the secondary school course are concerned, we recommend the following scales of pay:

(a) The minimum pay of a primary school teacher who has completed the secondary school course should be Rs. 100. This minimum should be given effect to immediately; and within a period of five years, it should be raised to Rs. 125.

(b) The minimum pay of primary school teachers who have completed the secondary school course and are trained, should be Rs. 125; and within a period of five years, it should be raised to Rs. 150.

(c) The following scales of pay should be adopted, as soon as practicable and at any rate not later than the first year of the fifth plan, for all primary school teachers who have completed the secondary school course and are trained.

Starting salary ..	Rs. 150
Maximum salary (to be reached in a period of 20 years) ..	Rs. 250
Selection grade available for 15 per cent of the cadre ..	Rs. 250 to 300

Note

(i) The scale should be the same for all qualified and trained teachers working at all the sub-stages—pre-primary, lower primary or higher primary—and, in accordance with the principle of parity, should also be given to teachers in local authority and private schools.

(ii) Only the scales of pay of qualified and trained primary teachers are to be upgraded substantially. The scales of pay of the other categories of primary teachers need not be upgraded to the same extent. It should be an objective of administrative policy to keep them substantially lower so that the teachers would have an adequate incentive to improve their general and professional qualifications.

(iii) The expression 'trained' should be interpreted to mean teachers who have had two years of professional education.

In other words, these improvements in remuneration will be linked with improvement in the quality and qualifications of primary teachers. The principal method to be adopted to raise the average remuneration of primary teachers will be to organize an intensive programme of raising the qualifications of teachers in service, as described in the next chapter, and to eliminate, in a phased programme spread over a period of about ten years, all teachers other than those who are qualified and trained.

(3) Our attention has been drawn to an anomaly which must be removed as early as possible. Several States restrict, on financial grounds, the number of posts which carry the salary scale of trained teachers who have completed the secondary school course. The remaining posts are usually assigned to lower scales of pay sanctioned for teachers with lower qualifications. Not infrequently, persons with lower qualifications are recruited to these posts even when qualified and trained teachers are available. This is bad enough; but what is worse, even trained and qualified teachers who are recruited against the posts are given, *not* the salaries of qualified and trained teachers to which they are entitled, but the lower salaries meant for these posts. As the completion of secondary school course and two years of professional training are accepted to be the minimum qualification for a primary teacher, this practice should be abandoned as early as possible and the principle adopted that every trained teacher who has completed the secondary school course receives the scale of pay sanctioned for such teachers. This will remove an injustice now being done to a large number of teachers in service, and create an incentive for unqualified or untrained teachers to become qualified and trained.

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[1] There is one exception to this rule. As stated already, the headmasters of all higher primary schools and of lower primary schools with an enrolment of more than about 200 should be trained graduates. The salaries of trained graduates working in the above posts at the primary stage should be the same as those of trained graduates working in secondary schools. This will be discussed in the following section.

3.17. Scales of Pay of Teachers in Secondary Schools. At present, the scales of pay of teachers at the secondary stage are fixed in a rather haphazard manner and scales of remuneration do not always show a clearly integrated picture from primary school to the university. Some definite principles in fixing their pay-scales and relating them to the scales of pay of primary school teachers on the one hand and those of the university teachers on the other must be followed. In this context, we suggest the following:

(1) The scales of pay fixed for headmasters of lower and higher secondary schools should have a definite relationship with those of the teachers in affiliated colleges or even in universities. Depending upon the quality, size and function of the school and the qualifications of the person concerned, the salary scales of the headmasters of lower secondary schools should be the same as those of junior or senior lecturers or readers. In the higher secondary schools, the principals or headmasters should be entitled to the scales of pay of a reader and, in some selected institutions, even to that of a professor. This would help to lessen the gap between salaries at the school and university levels.

(2) On the basis of their general education, the assistant teachers in secondary schools can be divided into two categories : graduates and those with postgraduate qualifications. The relative proportions of these two categories should be definitely prescribed. We recommend that, depending upon the size, function and quality of school, the proportion of teachers with postgraduate qualifications should vary from about 10 to 30 per cent. It may be pointed out that, by 'postgraduate' qualifications, we mean the same type and level of qualifications as are prescribed for junior lecturers in affiliated colleges. Teachers with other postgraduate qualifications should be fitted in the scale of pay for graduate teachers in a suitable manner.

(3) The scales of pay of trained graduate teachers should have a minimum of Rs. 220 rising to Rs. 400 in a period of about 20 years. There should be a selection grade which would rise to Rs. 500 and be available to about 15 per cent of the cadre.

(4) Teachers with postgraduate qualifications in higher secondary schools should have the same pay scales as junior lecturers, *i.e.*, Rs. 300—600, since their academic qualifications will be the same. They should be given one increment when trained.

(5) Teachers with first and second class in B.A./B.Sc. or M.A./M.Sc. should be given advance increments in the above scale. An advance increment should also be given to those who are M. Eds.

(6) Professional training should be obligatory for all secondary school teachers. It should preferably be taken before first employment. Exceptions may be made in the case of teachers with postgraduate qualifications and of first and second class graduates. They may be untrained at the time of appointment but should take professional training within three years. All untrained teachers, however, shall remain on their own starting salary and be integrated into the regular scale of pay only after professional training.

3.18. The effect of these proposals can be appreciated in relation to the existing situation. The Commission carried out a study of the emoluments of school teachers in 29 districts (out of a total of 312) and its relevant findings are shown in Table 3.2.

TABLE 3.2. EMOLUMENTS OF SCHOOL TEACHERS IN 29 DISTRICTS (1965)

Emoluments per month	Percentage of Teachers		
	Lower primary	Higher primary	Secondary
Rs. 60 and less	2.2	2.3	
60—80	15.7	4.9	
81—100	29.9	14.1	4.3[1]
101—120	25.4	19.3	9.1
121—140	22.1	31.1	13.2
141—160	2.9	13.0	17.6
161—180	1.2	6.0	11.7
181—200	0.3	6.5	9.7
201—220	0.3[1]	1.2	6.5
221—240		1.0	6.3
241—260		0.5	5.2
261—280		0.2	4.7
281—300		0.1	4.4
301—320		0.1[1]	1.9
321—340			1.7
341—360			1.1
361—380			0.7
381—400			0.5
401—420			0.8
421—440			0.2
441—460			0.2
461—480			0.0
481—500			0.1
Above 500			0.1
	(100.0)	(100.0)	(100.0
n	94,434	30,624	17,707
N	1,329,544	431,158	249,298

[1] The figures represent 'Rs. 201 and above' in the case of lower primary teachers; 'Rs. 301 and above in the case of higher primary teachers ; and 'Rs. 100 and less' in the case of secondary teachers.

'n' indicates the number of teachers included in this study.

'N' represents the total number of teachers in the category concerned.

For source and other details, see Supplementary Volume I, Part IV.

3.19. **Recruitment of School Teachers.** As at the university stage, the improvement in the salaries of school teachers must be linked with an improvement in their qualifications and methods of recruitment. The responsibility for this will be on the State Education Departments. The qualifications of teachers will have to be prescribed by the State Board of School Education and the Education Departments would have to devise proper procedures for their recruitment. Our recommendations regarding the qualifications of school teachers have been given above. In the light of these and in view of local conditions, we trust that the State Board of School Education would prescribe the qualifications for primary and secondary teachers in all schools—governments, local authority or private. With regard to methods of recruitment, we make the following suggestions:

(1) *Government Schools*. The existing methods of recruitment are satisfactory.

(2) *Local Authority Schools*. With regard to local authority schools, we recommend in Chapter X the constitution of district school boards which will remain in charge of all school education within a district. They will recruit the teachers required for their schools through selection committees consisting of a representative of the district school board, the District Education Officer or his representative, and a panel of two or four persons as may be prescribed by Government.

(3) With regard to *private schools*, the existing position leaves much to be desired and the recruitment procedures will have to be tightened on the lines recommended earlier for affiliated colleges. Every school recognized and aided by the State Education Department should be required to have a managing committee on which there would be representatives of the Department. The Department should also prescribe the qualifications for teachers which should be similar to those in government institutions. Every post to be filled should be adequately advertized and interviews should be held by a selection committee duly constituted by the managing committee and having on it one or more experts, depending upon the importance of the post. A report on the applications received, interviews held and final

selection made should be submitted to the Department for approval. As in the case of private affiliated colleges, it will be necessary to leave the authority to appoint teachers with the managing committees of the schools. But unless a teacher is appointed after the procedure prescribed above is followed and approval is obtained, no grant-in-aid should be paid on his salary, and there should be no hesitation in withholding such approval. A discriminating approach will have to be adopted and greater freedom in these matters should be allowed to good and efficient managements while those which fail to maintain standards or leave room for malpractices should be controlled more rigorously.

3.20. **Promotional Prospects.** Unfortunately, promotional prospects for teachers are poor at almost all stages, and it is this aspect, rather than the scales of pay as such that often deter talented persons from joining the profession. Steps should therefore be taken to see that good promotional prospects are provided at all stages of education, not only for improving qualifications, but for rewarding good teaching. For this, we make the following proposals:

(1) *School Stage.* (a) Qualified and trained teachers in primary schools should be considered for promotions to higher posts as headmasters or inspectors of schools, ordinarily meant for trained graduate teachers. About ten to fifteen per cent of these posts should be reserved for such promotions.

(b) Similarly, trained graduate teachers who have done outstanding work as teachers should be eligible for promotion to ten to fifteen per cent of the posts carrying salaries of teachers with postgraduate qualifications.

(c) It should be made possible for school teachers who show the necessary aptitude and competence to be appointed as university teachers. To help in this, the UGC should give *ad hoc* grants to outstanding school teachers to do research into problems of interest to them and incidentally to qualify themselves for work at the universities.

(d) Scales of pay spread over twenty years cover too long a period. It would be desirable to introduce a system under which teachers obtain advance increments for outstanding work. About 5 per cent of teachers should be able to reach the top of the scale in about ten years, and another 5 per cent in about 15 years.

(2) *University Stage.* The following measures may be considered:

(a) An *ad hoc* temporary post in the higher grade should be created for a lecturer or a reader who has done outstanding work and who cannot be given his well-earned promotion because no suitable posts are vacant. He should then be absorbed against an appropriate permanent post as soon as it becomes available. Before such promotions are made, the work of the persons concerned should be evaluated by a specially constituted expert committee and the approval of the UGC obtained. An arrangement of this type already exists in the CSIR and ICAR.

(b) In some departments where outstanding work is done, the number of posts at the professor's level should be determined on the requirements of the department and should not be arbitrarily restricted to one.

(c) If the services of an outstanding person are to be retained or obtained at the professorial level, it should be open to the university concerned, in consultation with the UGC, to offer a suitable remuneration even beyond the special scale of Rs. 1,600—1800. Each case should be considered on its merits and considerable elasticity should be permitted in fixing salaries.

3.21. **Relating Salaries to Costs of Living.** Two other points which have often been raised in the discussions with us, deserve notice. The first of these relates to the adjustment in salaries consequent upon a rise in prices. It has been suggested that, after salaries have been revised adequately in line with present price-levels, a mechanical formula should be adopted to adjust them to future movements in the cost of living, as has been done, for instance, in the case of industrial workers. While we realize the need to link salaries with the cost of living, we think that this can be better done through the principle of parity. We have recommended that all salaries of teachers should be reviewed every five years; and we have also recommended the principle of parity under which the dearness allowance to be paid to all teachers should be related to those of government servants. This will ensure adequate adjustments of salaries and allowances to movements in cost of living.

3.22. **Welfare Services.** A large number of suggestions have been put forward with a view to providing certain welfare services to teachers such as grant of free housing, free education for children, and free or subsidized medical facilities. While suggestions of this kind may serve as transitional measures until adequate salary scales are adopted, we do not think that an emphasis on such marginal benefits is the right approach to an equitable solution of the problem. The best course would be to pay the teachers adequately so that no special benefits of this type need be offered.

3.23. One important proposal, however, needs consideration. This relates to the need to organize a general programme of welfare services for all school teachers in each State or Union Territory. The funds for this programme should be jointly raised, teachers contributing 1½ per cent of their salaries and the State contributing an equal amount. The entire amount thus raised should be administered by committees consisting of representatives of teachers and Government. There should be a State level committee to decide a broad policy, and district level committees to operate the fund in accordance with the general policies laid down. The fund could be utilized for grants for purchase of books and equipment, travel grants, scholarships for education of children, suitable assistance in case of serious sickness or disaster, and such other unforeseen calamities. When such a general welfare fund is created for each State or Union Territory, the existing teachers' welfare fund set up by the Government of India may be advantageously merged with it.[1]

3.24. **Financial Implications.** An obvious objection to these proposals for improvement of remuneration can be taken on financial grounds. It may be argued that, at the present and proposed levels of expansion of education, the country does not have the resources to adopt these scales of pay. We realize that the increase recommended by us will lead to a substantial increase in educational expenditure. But unless the salaries are upgraded to these or even better levels and unless a feed-back process is properly initiated and maintained, it will not be possible to improve standards, and education would be unable to make a significant contribution to national development. The future of education and consequently of the nation is at stake and the price must be paid. We believe that we can and should find the funds needed.

3.25. A study of the salary structure in educationally advanced countries reveals some interesting points. In some countries, *e.g.*, the USSR, teaching is among the best professions. In most of them, a wage comparable with other professions is assured. Salaries at the university level are generally high enough to attract a reasonable proportion of the best talent in the country. The gap between the salaries of university and school teachers is narrow. Even the highest salaries show a reasonable relationship to the national dividend; and the salary is related, not so much to the institution in which the teacher works, as to his qualifications. It is because of these factors that these countries can support a large expansion of education and also attract a fair proportion of talented persons to the teaching profession.

3.26. The reorganization of the salary structure for teachers on these lines is not generally feasible in a developing country where the general situation is exactly the opposite. For instance

—the salaries of teachers are high with reference to the national dividend;

—the salaries of teachers compare unfavourably with those of other public servants which are even higher; and

—there are wide differences between the salaries of teachers at different levels.

The basic reason for this situation is that the salaries of the superior ranks in government service are fixed very high and without any reference to the economic capacity of the people. The origin of this is often purely historical, as in our own country. Under the imperial regime, the salaries of the superior government servants were fixed, not in relation to the national dividend of the Indian people, but with reference to salaries prevailing in England. Consequently, salaries of the superior government servants (who were mostly Englishmen) came to be far above the economic capacity of the Indian people. Even when Indians were recruited to government services, these salaries were not reduced because it was not politically expedient to make any marked distinction between them and the expatriate officers. Hence the salaries of government servants as a class came to be fixed at a much higher level than what the country could afford. This position did not create any difficulties so long as the total volume of governmental services was limited. But it soon became the main bottleneck preventing the proper development of all social services in general and of education in particular. A solution was, therefore, attempted by the adoption of three questionable devices:

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[1] We recommend that these services should also be extended to university teachers. From this point of view, they should be permitted to join a common programme to be organized for all teachers on a State basis. In the alternative, each university may organize a welfare fund for its teachers on the above lines.

—Even in government service, the teachers were paid lower than other categories of employees who had the same (or even inferior) qualifications and responsibilities;

—The bulk of the educational enterprise was placed, not in the public or state sector, but under local bodies and in the private sector;

—The principle of parity was rejected and teachers in local authority and private schools were paid at lower rates.

We have recommended that these devious methods should be given up forthwith. If this is done and all teachers are to be paid adequately and on the basis of parity, there are only two ways in which the problem can be solved: either the salaries of all government servants should be reduced—which cannot be done unless all incomes are regulated—or the expansion of education will have to be restricted. Since the latter is neither desirable nor possible, the basic dilemma becomes clear: the State is not able to regulate all incomes and reduce the salaries of other public servants, and it does not have the money to give justice to teachers by raising their salaries to a level comparable to that of other Government servants.

3.27. The only rational way out of the situation would be to revise all salaries and base them, not on the historical legacies of the past, but on our needs for services and the economic capacity of our society to bear the financial burden. This would imply a substantial downgrading of many salaries and a drastic levelling down of other incomes. If such attempts were made, teachers would be ready to play their part, although they resist, and rightly so, any attempt to keep their salaries only at a lower level.

3.28. **Urgency of the Problem and Need for Central Assistance.** Before leaving this subject, we would like to stress two points. The first is the urgency of the problem. The need for improving the salaries of the school teachers in a big way is justified fully on its own merits and has become urgent, partly because of the programme of educational improvement we have in view and partly because of the rise in the cost of living. This urgency has been heightened by the recent revision of the salaries of university teachers which has widened the existing disparities even further. We, therefore, recommend that the proposals made by us regarding the improvement of salaries of school teachers should be given effect to immediately. The second point relates to Central assistance. During the first three plans, almost every State Government revised the salaries of teachers more than once and the assistance of the Central Government was made available, in some form or other, for most of these revisions because the expenditure on these programmes was always treated as a 'plan outlay'. The salaries of teachers are very much on the low side at present and the effort needed to raise them to satisfactory levels is huge, partly because of the size of the increment and partly because of the numbers involved. We are afraid that the State Governments will not be able to deal with this very significant problem quickly and adequately unless Central assistance is made available on a generous basis. We, therefore, recommend that liberal Central assistance should be given to State Governments for improving the salaries of school teachers as recommended by us. Whether this assistance is given to them through the plans or outside the plans is not really an important issue, although we are of the view that the existing practice of including this expenditure within the plan should preferably be continued.

RETIREMENT BENEFITS

3.29. **Principle of Uniformity.** Of the various schemes for retirement benefits now in force, probably the best is that provided by the Government of India for its employees. This includes a death-cum-retirement gratuity, pension or gratuity, depending upon the length of service performed, and a family pension. State Governments are now adopting it with certain modifications for their own employees but there are various differences between the benefits given to employees of the Central Government and those given to the employees of the State Governments. Similarly, no attempt is being made to extend the scheme to teachers in local authority and private schools.[1] We see no justification for these variations and recommend that the system of retirement benefits to teachers should be based on the principles of uniformity and parity. The principle of uniformity implies that retirement benefits should be uniform for all government servants—Central and State; and the principle of parity implies that retirement benefits given to teachers in government service should also be extended to teachers working in educational institutions conducted by local authorities and private organizations. The introduction of such uniformity and parity would not involve any large increase in expenditure and would be easier to adopt than even parity in remuneration.

3.30. **Retirement Benefits for School Teachers: Interim Measures.** While this is the ideal towards which administrations should move, some alternative transitional solutions to the problem may have to be adopted. With regard to school teachers, we make the following recommendations:

(1) *Age of Retirement*. For Government teachers, the age of retirement is 58 years in some cases, 55 years (with provision for extension up to 58) in others and in one State (West Bengal), 60 years. The same rules generally apply to teachers in local authority schools. For private school teachers, the age of retirement varies, from area to area, from 55 to 58 years and even to 60 years. In Bihar it is 62 years. In Orissa, there is no age limit for retirement and a person can work as long as he is physically fit. Until provision for adequate pension is made, it is desirable to provide for a higher age limit for retirement. We recommend that the normal retirement age for teachers should be 60 years; and there should be provision for extension up to 65 years provided the person is physically fit and mentally alert to discharge his duties efficiently.

(2) *Retirement Benefits*. The teachers in government schools are provided with pension, gratuity and family pension in most States. In others, provision is made for provident fund and insurance. The Union Territories generally offer the same benefits as are given to the employees of the Central Government.

With regard to teachers working in non-government schools, most of the States provide a contributory provident fund only. Recently, however, the Triple-Benefit Scheme, which provides for provident fund, pension and insurance, is becoming popular. Originally introduced in Madras, it has now been adopted in Andhra Pradesh (without insurance), Assam, Bihar, Kerala, Mysore and Uttar Pradesh. In addition, Kerala offers the same retirement benefits for teachers in non-government schools as are given to teachers in government schools, provided the former opt for the conduct and discipline rules applicable to government servants and renounce the right to participate in elections. West Bengal provides only provident fund and gratuity. The Ministry of Education has drawn up a Triple-Benefit Scheme for teachers in non-government schools which is now being adopted in the Union Territories.[2] In view of the progress already made, we recommend that, as an interim measure, the Triple-Benefit Scheme should be adopted for all teachers in non-government schools in all States and Union Territories.

The interest on the provident fund amounts of school teachers is now generally paid at 4 per cent per year. It should be much higher. There are also some other problems connected with its administration. We shall discuss these in some detail in the next section with reference to teachers in higher education. The same recommendations should be extended, *mutatis mutandis*, to the provident fund of the school teachers also.

3.31. **Retirement Benefits for Teachers in Higher Education: Interim Measures.** The retirement age for teachers in higher education is ordinarily 60 years, with provision for extension generally up to 65 years, and in a few cases, even up to 70 years. Most of the universities offer a contributory provident fund only. The rate of contribution is generally 8⅓ per cent of the basic pay. Some universities permit the teacher to contribute up to 15 per cent of his pay and their own contribution is credited, depending upon the salary, at 8 to 12 per cent. Some provide for gratuity in addition to contributory provident fund. In Madras, the Triple-Benefit Scheme has been extended to university and college teachers. A decision to the same effect has also been taken by the Central universities and the details of the proposal are being worked out. We recommend that it would be desirable to adopt the Triple-Benefit Scheme for all university and college teachers.

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[1] For details see paper on *Retirement Benefits for Teachers*, included in Supplementary Volume I, Part IV.

[2] See Supplementary Volume I, Part IV.

3.32. Where a scheme of provident fund is in operation—whether for school or college teachers,—we suggest the following changes:

(1) At present, a teacher begins to contribute to the provident fund only after he becomes permanent. In our opinion, the contribution to the provident fund, which is a compulsory form of saving, should begin right from the first day of a teacher's career. We, therefore, recommend that all teachers, whether temporary or permanent, should be required to contribute to the provident fund.

(2) The contribution of the employers to the provident fund of a teacher should be paid from month to month and the present rule that the teacher is not entitled to get employer's contribution if he leaves the service within five years, should be rescinded. It serves no useful purpose and is patently unfair to the teachers.

(3) At present, the amounts of the contributory provident funds of teachers are generally invested in the Postal Savings Bank where a separate account is maintained for each teacher. This has obvious administrative advantages. But financially, it is a very disadvantageous procedure. The rate of interest on deposits in Postal Savings Bank is only four per cent, though for long-term deposits like provident funds, the rate of interest should be six per cent or more. There is thus a considerable loss to teachers and we recommend that a more equitable system of investing provident fund amounts should be devised.

CONDITIONS OF WORK AND SERVICE

3.33. **Conditions of Work.** In creative work like teaching or research, the provision of stimulating conditions of work and adequate opportunities for professional advancement are extremely important and can play a very significant role in attracting and retaining the right type of persons in the profession. The conditions of work in educational institutions should be such as to enable teachers to function at their highest level of efficiency. This would imply the provision of certain minimum facilities in the classroom, essential teaching aids, library and laboratory facilities, and the maintenance of a manageable pupil-teacher ratio. It will also imply a system which encourages initiative, experimentation and creativity and gives adequate freedom to teachers in the organization of their courses and in the use of methods and techniques they consider most suitable. The hours of work should be similar to those of other public servants, account being taken, not only of actual classroom teaching, but also of other work connected with it, such as study and preparation, correction of exercises, evaluation, organization of co-curricular and extra-curricular activities, tutorials, seminars and other programmes of student guidance. Adequate facilities should also be provided for professional growth through seminars, summer institutes, grants for the purchase of books or conduct of research, liberal facilities for study and sabbatical leave for self-renewal, and adequate prospects for promotion to higher cadres. We also recommend that a scheme should be drawn up under which every teacher should get a concessional railway pass to any part of India once in five years on payment of a reasonable contribution related to his salary.

3.34. **Parity in the Terms and Conditions of Service.** The terms and conditions of service of teachers in government and local authority service are fairly satisfactory, except in one major particular: that the academic and civic freedom of these teachers is often severely restricted. The conduct and discipline rules applicable to teachers in government service (and these are generally extended to teachers in local authority service as well) are the same as for all other government employees. There is no reason why this should be so.

Each profession should have separate conditions of service; and the conduct and discipline rules for teachers should provide academic freedom which is essential to enable them to function efficiently. Moreover, existing conduct and discipline rules were mainly framed under a foreign regime when control of the political views of teachers was a major objective of official policy. Unfortunately, these rules, which have long become obsolete, are still substantially in force. It would, therefore, be desirable to frame separate and new conduct and discipline rules for teachers in government service, which would ensure them the freedom required for professional efficiency and advancement.

3.35. In so far as private schools are concerned, the difficulties are of two kinds: several private managements have not framed proper terms and conditions of service; and not infrequently, the services of teachers are terminated on inadequate grounds and without regard to fairness and justice. To meet the first of these difficulties, we recommend the adoption of the principle of parity and suggest that the terms and conditions of service of teachers in government and private schools should be the same. This will confer some material benefits on the teachers in private schools and give greater academic freedom to teachers in government schools. We feel that, as a general practice, the services of a teacher should be terminated only after the prescribed procedure is followed and he is given adequate opportunity to defend himself. In all cases, there should be an appeal to an arbitration tribunal consisting of a representative of the teacher, a representative of the management and a representative of the Department.

3.36. **Residential Accommodation.** The problem of residential accommodation is of great importance. Difficulties often arise in the rural areas when no residential accommodation is available locally and the teacher is compelled to stay in another locality. This interferes with the efficiency of his work and prevents him from building up proper contacts with parents or undertaking programmes of adult education. These and such other problems would be eliminated if it would be possible to provide reasonable residential accommodation for teachers in the locality itself. We recommend, therefore, that every effort should be made to increase residential accommodation for teachers in rural areas. It should be regarded as a responsibility of the local community to provide such accommodation. Wherever necessary and possible, state subsidies should be made available for the programme. In urban areas, and particularly in big cities, the problem is sometimes easier and sometimes more difficult than in villages. A programme of building construction and grant of adequate house-rent allowances in all big cities to enable teachers to obtain decent housing facilities is needed. Cooperative housing schemes for teachers should be encouraged and loans for construction of houses should be made available on favourable terms.

3.37. In the universities and affiliated colleges, it is necessary to provide residential accommodation. General experience has been that universities which provide residential accommodation to teachers have been able to obtain the services of eminent teachers and to retain them. The target to be reached over the next 20 years, should be to provide residential accommodation to about 50 per cent of the teachers in the universities and to 20 per cent in affiliated colleges.

3.38. **Additional Earnings.** The problem of additional earnings of teachers, over and above their salaries, deserves consideration. At the school stage, the chief source of additional earnings to teachers is private tuitions. This practice prevails largely in urban areas and, in many places, complaints are made that it has become almost a scandal. We realize that some children (these may be gifted children preparing to excel in examinations or backward ones who may need special aid to come up to the ordinary level) will need extra assistance from the teachers. In our opinion, such assistance should be provided, on an institutional basis, by the school itself. The teachers concerned should be adequately remunerated and the cost should be met partly by charging special fees and partly from school funds. At the university stage, the chief source of additional remuneration is part-time consultancy to government or industry, or remuneration from additional work, such as research carried out by the department, or fees for evaluating examination scripts. Such additional earnings should be permitted, though care should be exercised to see that the concession is not abused and that the work of the department does not suffer. The existing practice under which a teacher is required to pay a part of his earnings to the employing authority is, in our opinion, unfair. We think that such payment should not be required where the earnings do not exceed 50 per cent of the salary. If it exceeds this amount, a progressive reduction may be made.

3.39. Civic Rights. We attach great importance to the civic freedom of teachers. We consider the participation of teachers in social and public life to be highly desirable in the interest of the profession and the educational service as a whole, and that such participation will enrich the social and political life of the country. Teachers should be free to exercise all civic rights enjoyed by citizens and should be eligible for public offices at the local, district, State or national levels. No legal restriction should be placed on their participation in elections. When they do so, they should be expected to proceed on leave during the election campaign and to relinquish temporarily their teaching duties if the requirements of public office interfere with their proper discharge. Such participation should be in a purely personal capacity and care should be taken to see that the institution which the teacher serves or his students are not involved in it.

3.40. Women Teachers. Some discussion is needed regarding two important categories of teachers with special problems—women teachers, especially for rural areas, and teachers for tribal localities. At present women teachers form the majority at the pre-primary stage. At other stages, the proportion of women teachers has been continually increasing in the post-independence period as the statistics in Table 3.3 will show.

TABLE 3.3. WOMEN TEACHERS (1950-65)

Item	1950-51	1955-56	1960-61	1965-66 (estimated)
1	2	3	4	5
1. *Women teachers in lower primary schools*				
Total no. of women teachers	82,281 (18)	117.067 (20)	126,788 (21)	200.000 (24)
2. *Women teachers in higher primary schools*				
Total no. of women teachers	12,887 (18)	23,9[illegible]4 (19)	83,532 (32)	140,000 (37)
3. *Women teachers in secondary schools*				
Total no. of women teachers	19,982 (19)	35,085 (23)	62,347 (27)	95,000 (28)
4. *Women teachers in schools for vocational education*				
Total no. of women teachers	2,131 (23)	2,966 (22)	3,948 (17)	4,200 (17)
5. *Women teachers in institutions for higher education (arts and science)*				
Total no. of women teachers	1,716 (10)	3,136 (13)	5,645 (16)	8,512 (17)
6. *Women teachers in colleges for professional education*				
Total no. of women teachers	334 (7)	666 (8)	1,865 (12)	2,750 (11)

Source. Ministry of Education, Form A.

N.B. Figures in parentheses show the number of women teachers for every 100 men teachers.

It will be seen that the number of women teachers in lower primary schools has increased from 82,000 to 200,000 or from 18 to 24 per 100 men teachers. In the higher primary schools, where the demand for women teachers is great, especially in rural areas, their number has increased from 13,000 to 140,000 or from 18 to 37 per 100 men teachers. In secondary schools and colleges of arts and science, the increase is not so large, but shows steady progress. It is only in vocational schools and colleges—and this is not unexpected—that their number is still very limited.

3.41. It is necessary to emphasize the need for the employment of women teachers in increasing proportions. At the lower primary stage, they make good teachers; and in many rural areas, the presence of a woman teacher will bring more girls to schools. At the higher primary stage, the employment of women teachers and the conduct of special schools for girls will be necessary for some years to come in most of our rural areas. In secondary schools and colleges of arts and science, the proportion of institutions for girls is continually increasing. These are mostly staffed by women teachers. Even in the remaining institutions, a large majority are really mixed institutions with some proportion of girls attending. In all of them, it should be a rule to have at least one woman teacher on the staff and where the number of girls is large, at least one woman teacher for every 30 girls. Girls are also increasingly attending vocational schools and this emphasizes the need for the employment of more women teachers in them.

3.42. This problem was examined in detail by the National Committee on Women's Education which has made a number of useful recommendations on the subject. We support them fully. For convenience of reference, however, we would highlight the following recommendations·

(1) The employment of women teachers should be encouraged at all stages and in all sectors of education.

(2) Opportunities for part-time employment of women teachers should be provided on a large scale in order to enable married women to look after their homes in addition to teaching.

(3) Residential accommodation should be provided for women teachers, particularly in rural areas, on a priority basis.

(4) In order to get women teachers to work in rural areas in adequate numbers, the scheme of condensed courses for adult women which is now being operated upon by the CSWB should be expanded. Promising girls from rural areas should be given scholarships to educate and train themselves to become teachers.

(5) Many women cannot remain away from their homes for long periods as is often required in courses for professional training or of further general education. They will, however, be greatly benefited by private study and correspondence education. These facilities should be specially provided for them.

(6) Wherever necessary, special allowances may be given to women teachers working in rural areas.

3.43. **Teachers for Tribal Areas.** Equally important is the need to secure the services of good teachers for tribal areas. It will be necessary to give special allowances to such teachers because they have to live under very trying conditions. Assistance may also have to be provided for the education of their grown-up children. Residential accommodation is very often a must as no rented buildings are available in places where the tribals live.

It is also desirable to provide some special training to teachers who are going to work in tribal areas. This should include a study of the tribal language or languages and of tribal culture. In States where there is a large tribal population, special institutions will have to be set up to provide orientation courses to teachers posted to tribal localities. Encouragement should also be given to tribal young men and women to become teachers in the schools of these areas.

3.44. **Teachers' Organizations.** Teachers' organizations in all parts of the world have followed, or are following an almost identical pattern of growth : starting as 'trade unions' designed to fight for material benefits and gradually becoming bodies concerned with many aspects of their members' lives. The National Union of Teachers in the UK, for instance, was founded in 1870 because of a desperate need to improve salaries and conditions of work. Since then it has broadened its functions enormously, though it still continues to be active and increasingly successful in negotiating material benefits for its members. In India also, teachers' organizations are developing on the same broad lines. Most of them are currently engaged, and rightly so, in securing better salaries and conditions of work for teachers. But some of them have already started other programmes of academic work and are conducting research, organizing in-service education and producing literature needed by teachers. On the whole, however, the teachers' organizations have still a long way to go, especially in the development of their academic programmes. While the States can assist in this undertaking, it is essentially a task for the teachers themselves.

3.45. Some of the functions of teachers' organizations will be

- to secure for their members, individually and collectively, their rightful status—social, economic and professional;

- to safeguard their professional interests and to secure satisfactory conditions of work and service;
- to secure the professional growth of teachers through refresher courses, seminars, publications, library service and research;
- to work for the improvement of education in response to the challenge of the ever-changing socio-economic situation;
- to improve the teaching of subjects through the establishment of subject-teachers' associations; and
- to establish a professional code of conduct for teachers and to ensure that it is followed by members.

Professional organizations of teachers fulfilling the above functions and having a responsible and representative body of members should be recognised by the Central and State Governments. Such recognition should entitle them to the right of being consulted on all matters relating to school education, general and professional education of teachers, and their salaries and conditions of work and service.

3.46. **Joint Teachers' Councils.** On the lines of the scheme recently approved by the Government of India for joint consultative machinery and cumpulsory arbitration for Central Government employees, we recommend the constitution of joint teachers' councils in each State and Union Territory. These councils should consist of representatives from teachers' organizations and officers of the Education Departments, with the Secretary, Education Department, as chairman. These would meet as often as necessary but at least once in six months. Their scope and functions will include all matters relating to conditions of service and work, welfare service of teachers of all categories, and general programmes for the improvement of education.[1] The councils will be advisory bodies; but there would be a convention that, subject to the final authority of the State Cabinet, agreements reached at the council shall become operative. If there is a total failure of negotiations, compulsory arbitration should be provided for in respect of matters of pay and allowances, hours of work and leave. The joint teachers' councils will create a forum where the officers of the Department will meet the representatives of teachers' organizations at a sufficiently high level. We trust that this would help to build good relations between teachers and the State Governments and promote the cause of education by smoothening the innumerable administrative problems which are not promptly dealt with and which, by causing much avoidable suffering and inconvenience to teachers, have an adverse effect on educational standards.

3.47. **Social Status and Morale.** The efficiency of the teaching profession and its contribution to national development in general and educational improvement in particular, will depend largely on its social status and morale. This will, in its turn, depend upon two inter-related factors: economic status and civic rights of teachers, and their professional competence, character and sense of dedication. Throughout the world, the general experience has been that, as the material rewards of teachers are elevated, it becomes possible to recruit into the profession individuals of a continually improving quality and with more extended professional training; and in proportion as the competence, integrity and dedication of teachers has increased, society has been increasingly willing—and justifiably so—to give greater recognition to their material and economic status. We visualize a similar development in India over the next twenty years.

3.48. **National Awards for School Teachers.** For some years past, the Ministry of Education has been operating a scheme of national awards for school teachers.[2] The principal object of the scheme is to grant recognition to school teachers who have done outstanding work and helped to raise the status of the teaching profession. By and large, the scheme has worked fairly well. We would, however, request the Ministry of Education to examine the following suggestions which were made to us regarding this scheme and which, in our opinion, will improve its effectiveness.

(1) The number of awards is very small at present. In our opinion, there should be about 500 awards. At the primary stage, it is very difficult to compare the merits of teachers working under entirely different conditions. We, therefore, suggest that, broadly speaking, an award should be given every year to a primary teacher from each

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[1] With regard to recruitment, promotion and discipline, the councils will deal with matters of general principles only and not with individual cases.

[2] Similar schemes have also been in operation in some States.

district. For secondary teachers there should be about 200 awards in all, given on a State-basis as at present.

(2) In order to minimize the influence of non-educational considerations such as politics or caste, it is desirable to strengthen the selection committees for the awards at all levels. With the committees at the State level, some outstanding non-official educationists and teachers known for their integrity and public status should be associated, and to the extent possible, this should also be done in the district-level committees.

(3) The travelling allowance given to the teachers receiving awards should be on the same basis as for Class I officers of the Government of India. The arrangements for their stay in Delhi should be comfortable and generous.

CHAPTER IV

TEACHER EDUCATION

I. *General.* (1) Significance; (2) Major weaknesses in the existing system of professional education.

II. *Removing the Isolation of Teacher Education.* Breaking the isolation: (4) from universities; (7) from schools; (10) from one another; comprehensive colleges; upgrading training institutions for pre-primary and primary teachers; State Boards of Teacher Education.

III. *Improving the Quality of Teacher Education.* (14) Reorientation of subject knowledge; (15) Duration of the training course; (18) Integrated courses of general and professional education; (21) Vitalizing professional studies; (23) Improving methods of teaching and evaluation; (25) Improvement of student-teaching; (26) Development of special courses and programmes; (27) Revision and improvement of curricula; (28) Curriculum for the professional education of primary teachers; (31) Curriculum for the professional education of secondary teachers; (33) General observations; (35) Postgraduate courses.

IV. *Improving the Quality of Training Institutions.* (41) Training institutions for secondary teachers—staff; (43) Students; (44) Facilities; (45) Improvement of institutions for primary teachers—staff; (47) Students; (51) Other facilities; (52) Tuition fees; (53) Demonstration or experimental schools; (54) Expansion of training facilities—State plans; expansion of facilities; part-time facilities; correspondence education; evening or part-time courses; clearance of backlog; size of institutions; location.

V. *Continuing Professional Education of Teachers.* (55) The role of the school; (56) Part-time and whole-time in-service education; (57) In-service education of school teachers; (58) Professional preparation of teachers in higher education.

VI. *Maintenance of Standards in Teacher Education.* (63) Need for organizations at the State and national levels; (64) The role of the Centre.

4.01. **Significance.** A sound programme of professional education of teachers is essential for the qualitative improvement of education. Investment in teacher education can yield very rich dividends because the financial resources required are small when measured against the resulting improvements in the education of millions. In the absence of other influences, a teacher tries to teach in the way in which he himself was taught by his favourite teachers and thus tends to perpetuate the traditional methods of teaching. In a situation like the present when new and dynamic methods of instruction are needed, such an attitude becomes an obstacle to progress. It can be modified only by effective professional education which will initiate the teachers to the needed revolution in teaching and lay the foundations for their future professional growth. First-rate teacher training institutions can thus play a crucial role in the development of education.

4.02. **Major Weaknesses in the Existing System of Professional Education.** Unfortunately, the professional education of teachers has been comparatively neglected in the post-independence period. Its significance was stressed by the University Education Commission (1949), the Secondary Education Commission (1953) and the International Team on Teachers and Curricula in Secondary Schools (1954). Several seminars were held and study groups were appointed to discuss improvements in elementary and secondary teacher education. But their recommendations have not yet been implemented in any large measure. By and large, training institutions for primary and secondary teachers have remained isolated from the main stream of the academic life of the university, as well as from the daily problems of the schools. The quality of training institutions remains, with a few exceptions, either mediocre or poor. Competent staff are not attracted; vitality and realism are lacking in the curriculum and programme of work which continue to be largely traditional; and set patterns and rigid techniques are followed in practice-teaching, with a disregard for present-day needs and objectives. A comprehensive programme of improvement is urgently needed in teacher education and we propose to discuss this under the following heads:

- Removing the isolation of training institutions by bringing them into the direct stream of the academic life of the universities and by building up closer relations with the schools and between the training institutions preparing teachers for different levels;
- Improving the quality of training programmes and training institutions;
- Expanding training facilities;
- Making adequate provision for the continuing professional education of all teachers: and
- Creating appropriate agencies, both at the Centre and in the States, for the maintenance of standards in teacher education.

REMOVING THE ISOLATION OF TEACHER EDUCATION

4.03. We attach great importance to the proposal to break the isolation of training institutions. In our opinion, this is the one reform that can make a break-through, vitalize teacher education and through it, the process of learning and teaching in our millions of classrooms. This isolation takes three forms:

- *Isolation from University Life.* The professional education of primary teachers is not looked upon as a concern of the universities. The professional education of secondary teachers is with the universities, no doubt, but it has become separated from other intellectual disciplines in the university and is treated almost as a Cinderella in university life.
- *Isolation from Schools.* Teacher education, both at the primary and secondary levels has become isolated from schools and current developments in school education.
- *Isolation from One Another.* The different types of teacher training institutions are isolated from one another and do not form an integrated community.

No significant improvement in teacher education is possible unless this isolation is broken.

4.04. **Breaking the Isolation from Universities.** Our first suggestion is that education should be brought into the main stream of the academic life of the universities. In India, the general trend has been to identify education with pedagogy. It has been taught mostly in training institutions and is studied only by those who decide to enter the teaching profession, *after* such a decision has been made. In the educationally advanced countries, however, education has developed considerably as a social science and a separate academic discipline. The realisation that education is an instrument of change—social, political and economic—is having far-reaching implications, not only for education as an intellectual discipline of great scientific and philosophic import, but for other disciplines as well. It is also worth noting that philosophers and social scientists have begun to give special attention to education as an important part of their fields of study. We, therefore, recommend that, in view of its increasing scope and importance, 'education' should be recognized as a social science or an independent discipline. We also recommend that 'education' as an elective subject should be introduced at the undergraduate and postgraduate stages on the lines indicated below:

(1) The courses in undergraduate education should give an orientation in three broad areas—sociological, philosophical and psychological foundations of education. The contributions of great educators, comparative education and a study of some of the current educational problems could be included in the course.[1] Moreover, the inter-relationship of education with national development in all its aspects needs to be stressed in these courses. A wide choice should be offered so that it would be possible for a student to choose education in combination with any other subject, *e.g.*, one or more of the natural sciences, mathematics, behavioural sciences, most subjects in the humanities, and even professional courses like engineering or social work.

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[1] See Report of the UGC Committee on *Education as an Elective Subject at the Undergraduate Stage*, New Delhi, 1966. We broadly agree with its recommendations.

(2) At the postgraduate stage, an M.A. degree in Education should be introduced, to be taken two years after the first degree in any subject. In addition, it should be possible at this stage to combine education with one other subject selected from a wide range in the humanities and the sciences. To begin with, this may even be left as an additional option and a scholarship may be given to students who offer it and who agree to be teachers after the completion of the course.

(3) In all these courses—undergraduate or postgraduate—a minimum teaching practice should be obligatory just as laboratory work is a compulsory part of the study of sciences. It should be possible for a student who has taken these courses, to become a teacher, after a period of internship and, if necessary, after some in-service education provided through summer institutes.

4.05. We recommend that this programme should be sponsored by the UGC in a few selected universities and developed speedily on a large scale. In each selected university, a Department or Institute or preferably a *School of Education* should be established to develop research and training programmes in collaboration with other disciplines. Its main functions would be

- — to conduct undergraduate and postgraduate courses in education;
- — to conduct courses in professional education for different categories of teachers—pre-primary, primary and secondary;
- — to provide extension services to a few institutions of teacher education at all levels and to assist them to grow;
- — to organize summer institutes and in-service programmes in subject content as well as in professional education;
- — to work in close collaboration with a few schools of all types with a view to developing research and evolving better curricula and techniques of teaching; and
- — to promote research in education, especially with an inter-disciplinary approach.

A practice should also be adopted of appointing eminent professors in different disciplines as part-time professors in the schools of education to explain new developments in their fields and the manner in which they will affect education at the school stage. Apart from the intrinsic value of such contacts for improving professional education itself, this measure will incidentally help in raising the status of professional education and in interesting leading intellectuals in school education.

This programme will have two incidental advantages. As education can be studied without any commitment to being a teacher and in combination with other subjects, many talented students will study it and if their interest is aroused sufficiently, some of them may join the profession. The study of education itself will also begin to receive the enriching inter-disciplinary attention that is now lacking.

4.06. **Breaking the Isolation from Schools.** To break down the isolation from schools, every training institution should be required to guide neighbourhood schools and their staff in planning their work and in using improved methods of teaching. Such extension work is needed as much for the improvement of schools as for the improvement of the training programme itself. We, therefore, recommend that an extension department should be established in each training institution—pre-primary, primary or secondary—and should be regarded as an essential part of the programme and the responsibility of the training institution as a whole. All members of the staff should participate in it, and it should not be left to the coordinator only. Excellent pioneer work has been done by the Department of Extension Programmes for Secondary Education of the NCERT by providing extension services in nearly 50 per cent of teacher training institutions at the secondary level. The National Institute of Basic Education has also made a small beginning at the primary stage. What is now needed is a deepening of the programme and its expansion to cover every training institution. It would also be desirable to transfer the control of these programmes to the States and to locate this control in the State Institutes of Education, whenever and wherever they are ready. Only a co-ordinating, advisory and clearing-house role in the scheme should be retained by the NCERT.

4.07. One other way in which training institutions can keep in active touch with schools would be through their old students. Institutions for teacher education should have effective alumni associations which would periodically bring together old students from far and near to discuss problems of common interest with the college staff. Such discussions which would cover achievements of individual teachers and difficulties experienced in implementing the programmes envisaged while under training, would benefit the institution as well as the past students now working as teachers, and provide opportunities for a follow-up of the schemes of work planned in outline during the training period. If there was anything that was unrealistic or impractical in them, the staff would see their way to modifying their approach. If the failure to implement was due to lack of enthusiasm or want of support from the school and the staff, attempts would be made to overcome the obstacles. The very idea that old students and the college staff would meet periodically to discuss reports of work and frame future programmes would keep up the enthusiasm of the students and lead them to try out their own ideas and projects instead of following routine methods. Such a close link between old students and the staff has immense potentialities for making teacher education dynamic and progressive.

4.08. Yet another method of breaking this isolation is to make student-teaching a comprehensive internship in which trainees are able to observe the entire work of the school and to participate actively in all the important professional activities of a teacher, both in and out of the classroom. Such comprehensive and fruitful internship will be possible only when there is a systematic collaboration and cooperation between the schools and the training institutions and when student-teaching is regarded as the joint responsibility of the producers (*i.e.*, the training institutions) and the users (*i.e.*, the schools and State Departments). Departments of Education should develop such collaboration by giving special recognition and status to schools selected for the programme as 'cooperating schools' and by providing them with adequate grants for equipment and maintenance (*i.e.*, to meet the entire cost of allowances to the supervising teachers). The pioneering experience of the Regional Colleges of Education will be of help in the development of this programme.

4.09. Collaboration between schools and training institutions could advantageously be extended beyond the internship programme. Selected teachers from cooperating schools could join the training college staff, on deputation, from time to time and participate, not only in the general programmes of the college, but also in evolving new plans of work and methods of teaching or in preparing teaching aids. They may teach in the experimental or demonstration school of the training institution and in exceptional cases, even work as a member of its staff. The training college staff itself, which will find a fruitful field of research in educational methods and practices opened up to them through their collaboration with schools, will benefit considerably if they can do some continuous teaching in the cooperating schools. For this purpose, they may be deputed annually to teach at least for a month or so in a school or to complete at least one unit of the school syllabus. A combination of training college staff trying out their principles of teaching, and school teachers drawing generalization from their practical experience, would be of great benefit to student-teachers and would assist in a continuous improvement in teaching techniques. Schools should gradually become responsible partners in teacher education, not only by the facilities they offer for student teaching, but by their active participation in professional studies and educational research.

4.10. **Breaking the Isolation from one Another.** Teachers for the different stages of school education or for special subjects are now trained in separate courses and in separate institutions. The training institutions for pre-primary and primary teachers have the status of lower secondary schools only, in terms of qualifications and remuneration of staff or the scale of contingent expenditure. There is also a total separation between training institutions for secondary school teachers and those for primary or pre-primary teachers. An important reform, therefore, would be to raise the status of training institutions for pre-primary or primary teachers to a collegiate standard and to end the fragmentation of teacher education which results in weakness at each level and greatly reduces the effectiveness of the programme as a whole.

4.11. The ultimate objective should be to bring all teacher education under the universities in such a manner that it continues to function in close collaboration with State Departments of Education and teachers' organizations. We concede that very few universities have shown an active interest even in the preparation of secondary teachers which is under their control, and that problems of primary teacher education have not attracted their attention at all. Nevertheless, from the point of view of the freedom and autonomy necessary for the growth and development of teacher education, as well as of academic and educational efficiency, teacher education at all levels should be brought within the scope of the universities.

4.12. To upgrade all training institutions for primary and pre-primary teachers to the university standard immediately would be impossible in view of the heavy costs involved and the large number of qualified teacher-educators needed. The programme which will have to be spread over a number of years with a suitable transitional strategy, should take three forms: (1) the establishment of comprehensive colleges; (2) a phased programme of upgrading all training institutions for pre-primary and primary teachers to the collegiate standard; and (3) the establishment of State Boards of Teacher Education as bridges, during the transitional period, between the training institutions for pre-primary and primary teachers and the universities.

(1) *Comprehensive Colleges.* Colleges should be established wherever possible to prepare teachers for several stages of education and/or for a number of special fields. Some institutions of this type already exist and have shown good results. What is now needed is a planned attempt to develop more institutions of this type and to add sections for training primary and/or pre-primary teachers to training colleges that now prepare teachers for secondary schools only.

(2) *Upgrading Training Institutions for Pre-Primary and Primary Teachers.* Institutions for the training of pre-primary and primary teachers (which now admit students who have completed the lower secondary stage of education and which will raise this admission qualification to the completion of the higher secondary stage in the course of the next 10 to 15 years) should be upgraded to the collegiate standard and a phased programme prepared for the purpose, separately for each State. This entails that the qualifications and salaries of staff should be comparable to those in affiliated colleges. The qualifications of students should also be comparable and curricula and programmes of teacher education should be brought under the control of the university. Given due priority and an adequate allocation of funds, it should be possible to do this within a period of 15 to 20 years.

(3) *State Boards of Teacher Education.* In the transitional period, when some institutions for teacher education would be under the Department and others within the fold of the universities, a bridge between them may be created by establishing State Boards of Teacher Education. These should consist of representatives of universities, State Departments of Education, principals of training institutions, the National Association of Teacher Educators and teachers' organizations. They should be responsible for all aspects of teacher education at the State level, such as—

(a) prescribing standards for training institutions;

(b) improving curricula, programmes, examinations, textbooks and instructional materials for teacher education;

(c) prescribing conditions for the recognition of training institutions and arranging for their periodical inspection;

(d) offering consultative services to the institutions;

(e) ensuring that candidates completing the prescribed courses are competent to teach in the schools of the State; and

(f) preparing plans for the immediate and long-term development of teacher education, both qualitative and quantitative.

Each Board should be set up by the State Government, and should have a full-time secretary. The State Institute of Education should be closely associated with it. The Board should take over all the functions of the Department of Education in regard to pre-primary and primary training institutions and should advise on the secondary training colleges which will be with the universities.

The establishment of State Boards of Teacher Education is not a new recommendation. It was made earlier by the Secondary Education Commission, the International Team on Teachers and Curricula for Secondary Schools and by a number of seminars and study-groups. Unfortunately, no action has been taken so far. We regard this as a crucial recommendation on which immediate action is needed.

IMPROVING THE QUALITY OF TEACHER EDUCATION

4.13. Our next recommendation is that the quality of the existing programmes of teacher education should be considerably improved. The essence of a programme of teacher education is 'quality' and in its absence, teacher education becomes, not only a financial waste but a source of overall deterioration in educational standards. We attach the highest importance to this programme of qualitative improvement. Existing programmes of teacher education are largely tradition, rigid and divorced from the realities of schools and existing or proposed programmes of educational reconstruction. Reorganization is needed at all levels and in all courses and it will not be possible for us to examine all aspects of this problem in detail. We shall, however, indicate here some broad principles on which this reorganization should be attempted. These are:

- re-orientation of subject-knowledge;
- vitalization of professional studies;
- improvement in methods of teaching and evaluation;
- improvement of student-teaching;
- development of special courses and programmes; and
- revision and improvement of curricula.

4.14. **Re-orientation of Subject-knowledge.** There should be provision in the training programme, at both primary and secondary levels, for a study of the subjects to be taught, in depth as well as in range. This study should not be confused with a programme of the study of subjects not offered at the college stage nor with the mere imparting of additional information in the subject. It should be a carefully planned content course which would include a study of fundamental concepts and their implications for the school syllabus, and of the textbooks and growing source materials to assist teaching at the school stage. About 20 per cent of the time in the training programme should ordinarily be given to such studies.

4.15. **Duration of the Training Course.** This raises the question of the duration of the training course. At the primary stage, a minimum of two years is needed; and if the course is lengthened to two years in all areas where it is one year, there would be no difficulty in providing the needed courses in subject-matter. At the secondary stage, where the duration of the course is only one year, it has been suggested that it should be increased to two years, to do justice to the existing heavy courses and to incorporate the proposed subject-matter courses. From a financial and practical point of view this does not seem feasible. However, it is possible to make better use of the existing duration by extending the working days in the academic year from the existing level of 180-190 days to 230 days. Academic years of such lengths have been adopted in some secondary training institutions with very good results; and we recommend that the reform should be extended to all institutions without delay.

4.16. Reorientation in the subject-knowledge of secondary teachers should be done in collaboration with competent university departments and, where necessary, with the arts and science colleges doing post-graduate work. Each training institution should work out a detailed scheme involving university departments or colleges and including the use of their laboratories and libraries. Professors and lecturers should cooperate with training college staff in developing and providing new courses. Similar courses for primary teachers should be provided by staff members holding a Master's degree in collaboration with the staff of arts and science colleges.

4.17. These re-orientation courses in subject-knowledge should be closely related to the special techniques and methods used in teaching the subject concerned. Set lesson plans with emphasis on rigid methods should be avoided and the student-teacher should be guided to develop his teaching programme in a creative manner.

4.18. **Integrated Courses of General and Professional Education.** An alternative way to link the study of subjects with professional preparation at the level of secondary teachers is to provide concurrent and integrated courses in general and professional education, on the pattern of teacher education in the USA. Courses of this type have been introduced in a few selected subjects in the Kurukshetra University in Punjab, in the Regional Colleges of Education and in one Rural Institute. In the Kurukshetra experiment, the total period of education has been reduced by one year, and the B.Ed degree can be obtained in four years after the SSLC or the Matriculation examination.

4.19. The utility and feasibility of these integrated courses have been widely questioned. It has been argued that this experiment has not, and will not succeed in India since a young student, about 16 or 17 years old, who has just completed secondary education does not ordinarily decide to be a school teacher. It is also contended that there is no evidence to show that the products of these integrated courses are better in any way than teachers who have first taken their degree and then completed their professional education; and that the dwindling enrolments in such courses (except where substantial stipends are provided) show that the experiment has no promising future. Although we do not subscribe to all the objections raised, it is obvious that these integrated courses, even when developed to their fullest potential, can only provide a very small proportion of the total number of trained teachers required at the secondary stage (estimates vary from 5 to 10 per cent) on account of the heavy expenditure involved therein. We feel that it would be wrong to place an undue emphasis on such marginal experiments and that, from the point of view of raising standards in teacher education, it would be better to concentrate on improving the professional one year course following the first or the second degree.

4.20. If such integrated courses are to be organized at all—and we do believe that they have a place in the elastic and varied system we are recommending—they should be organized in universities rather than in separate institutions set up for the purpose as is now being done in the Regional Colleges of Education. Such colleges necessarily prove to be expensive as regards staffing and equipment. High quality staff do not join such institutions readily as adequate facilities to pursue studies in their special academic field or for undertaking research do not exist. While existing colleges may continue, such institutions should not be expanded. The experiment should be tried, as we have recommended, in universities having strong departments or schools of education which should work in collaboration with departments in other subjects.

4.21. **Vitalizing Professional Studies.** It is not sufficiently realised that courses for professional subjects contain a great deal of matter which is either out of date or has little relevance to a teacher's work in the school. Such dead matter should be eliminated and replaced by what is directly related to th epersonal and professional needs of student-teachers. While the overcrowding of content should be avoided, there is need to co-ordinate and integrate the different courses and to root the entire curriculum in Indian conditions.

4.22. Two basic weaknesses are mainly responsible for the comparatively low status of professional studies in training institutions. The first is the absence of adequate research on problems under Indian conditions. This compels teacher-educators to explain theory, more often than not, with illustrations from foreign countries. There is also a tendency on the part of teacher-educators to deal too much with generalities and platitudes. The corollary to this is the absence of high quality original books on pedagogy and educational science as applied to India and prepared by Indian authors. Absence of such books is a glaring weakness at the primary stage where the student-teacher does not have adequate command over English and is compelled to fall back solely upon cheap guides written to help him to pass examinations. These deficiencies must be remedied and large-scale programmes to develop research in educational problems and to produce the needed educational literature in English as well as in the modern Indian languages need to be organized.

4.23. **Improving Methods of Teaching and Evaluation.** Methods of teaching and evaluation in training institutions are extremely important and the attitudes of the student-teacher will be infienced more by the methods *used* with them, than by what they are *formally taught* about the methods they should use in schools. Unfortunately there is little realization of this and the methods of teaching and evaluation used in the training institutions continue to be largely traditional. An immediate and drastic change is thus called for and we would like to make the following main suggestions:

- An attempt should be made to develop the student-teachers' maturity through contacts, experience, study and discussion. This needs the use of methods requiring student participation and independent study. As their earlier education cannot ordinarily be expected to have developed habits of self-study and independent thinking, the training institutions have to make good this deficiency to the extent possible and give students opportunities to think, read, study and discuss. Individual library work, preparation of reviews and reports, case studies, project work, discussions and seminars should form an integral part of the work of training institutions.

— Time should also be found to orientate students' attitudes to the significance and possibilities of the profession that they have chosen, to awaken a sensitiveness to the human factors involved, and to stress the social values of educational development.

— A number of new techniques and methods are being developed rapidly in the advanced countries, such as the use of radio, television and films in classroom teaching, programmed instruction and language laboratories, to mention only a few. In India, the radio has just been introduced in the schools and, in the next few years, the other aids would begin to be available on an increasing scale. It would be desirable that the teachers under training should be introduced to them, first in their own learning programmes and later on in their teaching practice.

4.24. The examination system also needs considerable reform. At present, the system of external examinations adopted for training institutions is very similar to that used in the schools and suffers from all the well-known defects. Unless this examination is reformed and the teachers are initiated into the new techniques of evaluation as a part of their training programme, the reform of examinations in schools will not be successful. A systematic effort has to be made, therefore, on a high priority basis, to improve the nature of the examinations in training institutions. Internal assessment, which evaluates all the work of a student under training, should also be introduced and emphasized as a regular feature. This has already been done on a small scale. Although it has raised the problem of uniformity of assessment of different institutions affiliated to the same university, it has also had a salutary effect on the training programme as a whole and encouraged work directly related to the responsibilities of a teacher. Early steps should, therefore, be taken to expand the use of internal assessment and to give it a more significant place in the final evaluation. In addition, teacher educators should maintain cumulative records of student-teachers in consultation with them. In this way, trainees will learn by doing how the cumulative records of their own pupils should be maintained.

4.25. **Improvement of Student-teaching.** At present, student-teachers are commonly required to give a specified number of isolated lessons, many of which are often unsupervised or ill-supervised. The practice of continuous block-teaching, the duration of which varies from two to six weeks, is adopted only in a few institutions and its organization still leaves much to be desired. In our opinion, student teaching should be provided in two stages. The objective of the first stage should be to orient the student-teacher to the entire school situation and to initiate him into actual teaching. He should have opportunities to observe good teaching and to become familiar with the school programmes as a whole. He should know the kind of service provided in the school library, the workshop, the art room and on the playground and the role played by teachers of different subjects and the career-master or the counsellor. He should become acquainted with the school assembly programme and the co-curricular activities in the school. He may begin his teaching practice with teaching individual children, then proceed to small groups and eventually learn to manage full classes having normal strength. The objective of the second stage should be to enable him to do continuous teaching for a specified period of at least eight weeks, under actual school conditions, by working as a teacher in a selected school. The first type of experience is easy to provide. But it is the second that is of crucial importance and we recommend that its provision should become an integral part of all teacher education at all levels on the broad lines discussed earlier.

4.26. **Development of Special Courses and Programmes.** New courses required to meet special needs should also be developed. We have already referred to the two-year M.A. course and to courses in education to be introduced at the undergraduate and post-graduate stages. At present, there are no special courses for headmasters. Since so much depends upon the heads of institutions, it would be desirable to introduce short induction courses for teachers who have been promoted as headmasters. There is an equally urgent need for special courses for teacher-educators of primary and secondary training institutions. The employment of graduates in primary schools—even at the lower primary stage—has been increasing and a special course designed for them could be of great value. It would also be desirable to train teachers for two consecutive stages, or in such a way that, with some further orientation or training, they could also teach at a higher level. The methods of teaching in Classes I and II need to be informal and it would be useful to train the teachers at this level in a combined course for pre-primary and primary schools. Similarly, there should be combined courses which prepare teachers both for primary and secondary schools. We recommend that further details of these courses should be worked out, on a high priority basis, by the Department of Teacher Education of the NCERT, in collaboration with the National Association of Teacher Educators.

4.27. **Revision and Improvement of Curricula.** The time has come when teacher-educators at all levels must review their curricula and programmes of work, particularly in view of our recommendations for the development of school education. The present curricula at the different stages have grown out of the traditional ones by accretion of subjects and topics, and lack of organic unity as well as functional utility. These must be revised in the light of the fundamental objective of preparing teachers for their varied responsibilities in an evolving system of education. They must not err either on the side of teaching specific methods and 'tricks of the trade' only, or on the side of teaching something too general and theoretical and far removed from the teacher's actual job. The basis underlying a teacher's varied functions must be examined and courses giving a grounding in the basic subjects must be developed.

4.28. **Curriculum for the Professional Education of Primary Teachers.** This curriculum is now divided into two parts. The theoretical portion includes principles of education, child development or child psychology, methods of teaching, school organization and health education; and the practical work includes craft, practice-teaching and activities of community living. We have no fault to find with this group of subjects. We, however, wish to stress that the subject-matter presented under the various heads in theory should be of direct relevance to the task that a teacher is called upon to perform in the school, that relationships among the different subjects should be worked out, and that they should be taught in an integrated manner. We have already stressed the need for providing adequate knowledge of subject-matter and for relating it to methods and materials of teaching. Student-teachers should understand the objectives and implications of the school syllabus and should have the necessary insight for developing its concepts in a way that will be meaningful to children.

4.29. There is, besides, a need for a continuing programme of general education for primary student-teachers. They need courses which will help them to build up a proper perspective of life, of our cultural heritage and of problems and aspirations of the nation as well as of human culture and civilization in general. Community living programmes, if organized properly, can develop a sense of responsibility, the capacity for cooperative living and a desire for social service. These would prove to be useful when the teacher is called upon to organize such activities in his school.

4.30. We have already spoken about the organization of practice-teaching. We would like to reiterate that in keeping with the goals of education in a modern society, the emphasis in practice-teaching and in courses on methods and materials should be on developing the problem-solving abilities of pupils, using assimilation and understanding of fundamental facts only as a basis. These abilities should first be developed in the student-teachers themselves by teacher-educators. No separate demonstration or exposition of the methods would be as effective as their use in the students' own learning.

4.31. **Curriculum for the Professional Education of Secondary Teachers.** At present the course at this level comprises a study of the foundations of education—philosophical, psychological and sociological—school organization, methods of teaching, practice-teaching and practical work. There is need here to eliminate irrelevant matter and to relate the curriculum closely to the teacher's responsibilities and to Indian conditions, problems and studies. The professional as well as general education courses should enable the student to understand and appreciate the nature of forces—social, political, religious, economic and technological—which are tending to transform modern Indian society, and the educational problems emanating from this transformation and the role of education in giving direction and purpose to it. Moreover, student-teachers at this level need to be provided with specific learning experiences in constructing achievement and diagnostic tests, in spotting talent, in developing enrichment programmes, in diagnosing difficulties of under-achievers and in planning remedial programmes.

4.32. The total programme of teacher education at this level also needs to be organized in the spirit of a community enterprise. The process of interaction between the different elements comprising the college community should be conducive to the enrichment of each one's personality. This is obviously applicable to training institutions at other levels also.

4.33. **General Observations.** We must make it clear that we do not expect training institutions to provide all the knowledge, skills and methods that will be required for carrying out various programmes. We cannot aim at turning out a finished product—a teacher who would be equipped fully with all that he may need for carrying out his responsibilities for all time. A complete training to meet all anticipated situations is neither possible nor desirable. The more dynamic a vocation, the less chances there are of giving a complete initial training. What is important in a teacher education programme is to develop in the student insight and understanding, the capacity to learn, and resourcefulness. When there is need for specific orientation, in-service programmes can be organized.

4.34. The curriculum and programme of activities to be followed in training institutions must be such as will meet the requirements of the national system of education. Teacher education curricula and courses at all levels will need to be revised from this point of view. This should be one of the earliest and the most significant tasks to be undertaken by the State Boards of Teacher Education and the Standing Committee of the UGC on Teacher Education whose establishment is discussed later in this chapter. We would like to suggest that the ground should be prepared for this by leading teacher educators coming together to discuss the curricula for the professional preparation of teachers in the light of our recommendations regarding the entire system and programme of school education, including curricula, methods of work, activities and examinations.

4.35. **Postgraduate Courses.** There is urgent need to improve the Master's or the second degree courses in education. We agree with the Review Committee on Education (appointed by the UGC) which has systematically reviewed these courses, that the existing courses for Master's degree in education lack effective and thoughtful direction and that they are mostly ornamental except for service in a training college. The existing courses are not closely linked with professional needs at a higher level nor do they have the depth and intensity necessary for the study of education as an academic discipline. They appear to have grown out of the B. Ed. courses without any clear idea of their purpose.

4.36. In our opinion, the general purpose of the postgraduate studies in education should be to enable the student to undertake a deeper, scientific and academic study knowledge and initiative. A postgraduate in some specific field requiring special knowledge and initiative. A postgraduate course of studies should include (1) core courses to provide the student with a perspective for the study of education and educational problems and to familiarize him with scientific ways of studying them, (2) courses in areas of specialization related to some field such as educational planning and administration, teacher education, guidance and counselling, educational evaluation, or psychological foundations of education, (3) the study of the methodology of research, and (4) a dissertation. The organization of the course should be flexible and allow for a wide choice to suit different purposes.

4.37. A postgraduate degree in education is not a necessary qualification for the teaching profession and should be taken only by persons of ability and special interest. It is also necessary to maintain the highest standards at this level because most of the teacher educators would come out of these courses. This would need the upgrading of the level of students, staff and institutions. Surveys reveal that the intellectual and academic calibre of entrants to the M.Ed. course is not high. This follows from the fact that the B. Ed. is considered to be a necessary qualification for admission to the M. Ed. course and not many first or second class graduates choose to go in for the B. Ed. course because of the poor prospects in the teaching profession. We recommend that there should be a rigorous selection of students—the postgraduate course should be taken only by those whose academic and professional record is of a high order—at least a good second class in both the degrees. The staff in charge of postgraduate work should also have special competence and the university committees granting recognition to such staff should be strict in the selection, and grant recognition only after interviewing the persons concerned. It should be remembered that every one who lectures at the B. Ed. level is not necessarily suitable for postgraduate work which needs a deeper academic study and sustained intellectual effort. Similarly, postgraduate work should not be looked upon as an essential function of all teacher training institutions—only those institutions which have a competent staff suitable for the purpose and the needed facilities, should undertake it.

4.38. We think that the period of two academic terms over which this course generally extends is too short to do justice to the study of the subject, preparation of a dissertation and for activities like discussions, study-groups and seminars. It would be desirable to increase the duration of the course to three academic terms.

4.39. We consider that the development of educational research will go a long way in preparing persons competent to work at the postgraduate level. Every postgraduate lecturer need not be a research worker. But he must at least have made a study of the findings of research in his special field. We propose to deal with research in education in detail elsewhere.[1]

IMPROVING THE QUALITY OF TRAINING INSTITUTIONS

4.40. If the training programmes are to be improved on the lines recommended in the earlier sections, an essential precondition is the improvement of training institutions. We shall discuss the two main categories of training institutions—those for secondary teachers and those for primary teachers—and show how their staff, students and facilities can be improved. These recommendations will apply, *mutatis mutandis*, to other categories of training institutions.

4.41. **Training Institutions for Secondary Teachers: Staff.** The staff of these institutions is inadequately prepared for its task. A study has revealed that 40 per cent of the staff in these institutions have only a B.A. degree in addition to the B. Ed.; 58 per cent hold a Master's degree in education or in an academic subject; and only 2 per cent have a doctoral degree. In our opinion, the staff of these institutions should have a double Master's degree, in an academic subject *and* in education, and a fair proportion (say, 10 per cent) should also have a doctorate. They should also have studied teacher education as a special subject at the M.Ed. or through a special education course. Salary scales should be the same as for lecturers, readers and professors in arts and science colleges; but two advance increments should be given in recognition of the professional training received.

4.42. We make the following additional recommendations:

(1) The supply of trained teachers qualified to work in these institutions should be quickly and greatly increased by securing a substantial increase in the output of Ph.Ds., M.Eds. and M.As. in Education. An adequate number of scholarships should be available to attract good students to these courses; and it should be the main responsibility of the schools of educaton recommended earlier to train them.

(2) Insistence on professional qualification in education often debars teachers with specialization in other disciplines from working on the staff of training institutions, although they could have helped to raise standards. This requirement should be relaxed. In subjects like educational psychology, sociology, science or mathematics, it would be desirable to appoint qualified specialists in these subjects even though they may not have professional training.

(3) In Government institutions, the staff is generally interchangeable with inspecting officers and very often it is the weak and undesirable persons that are transferred to training institutions. It is essential that the best and the most competent persons available are selected for the faculty of training institutions.

(4) Adequate programmes of summer institutes should be organized for the in-service education of the training institution staff.

4.43. **Students.** Unfortunately the subject-knowledge of the graduate teachers who now join the profession or come to training institutions leaves much to be desired. There are several reasons for this:

— In many States, there is no rule that a secondary school teacher should teach only that subject which he has studied for his degree, and very often teachers are called upon to teach subjects which they learnt only at the secondary school. This is commonly the case with graduates of philosophy, sociology, or economics which subjects are not included in the school curriculum.

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[1] Chapter XII.

- The facilities at the university stage for certain subjects like geography are so inadequate that these subjects are taught mostly by amateurs who have first to learn the subject themselves.
- A very large proportion of graduates who join the teaching profession have taken their degree only in the third class and often have inadequate knowledge even of the subject in which they hold a degree.
- An adequate number of teachers holding the postgraduate degree is not available for the higher secondary stage.
- There are acute shortages of teachers in subjects like mathematics, science and English.

These deficiencies in subject-knowledge become serious hurdles to progress when it is proposed to upgrade the curricula of secondary schools substantially. The obvious long-range solution is to improve standards at the degree stage and to raise the remuneration of teachers so that competent persons join the profession in adequate numbers. This is what we have recommended. But in the transitional period when large numbers of teachers with inadequate subject-knowledge are already in service or will join it in the next few years, the following additional measures would be needed:

(1) Universities should adopt a rule that no student would be allowed to specialize in the teaching of a subject unless he has studied it for his first degree or obtained an equivalent qualification prior to training. Similarly, all States and Union Territories should adopt a rule that teachers in secondary schools will ordinarily teach only those subjects which they had studied in academic and professional courses. Such rules already exist in some States and deserve to be universally adopted.

(2) If teachers are required to teach other subjects, they should do so only after taking a special course in the subject, either by correspondence or in summer institutes. Universities should institute correspondence courses for awarding diplomas in the content of school subjects. It should also be open to teachers to study privately and take these diplomas. In addition, a large programme of summer institutes should be organized for the purpose.

(3) The output of postgraduate degree holders in school subjects should be increased. Liberal scholarships to cover the entire cost of education should be given at the postgraduate and undergraduate stages in scarcity areas like science, mathematics and English on condition that the scholarship holder, on completion of the course, teaches in a secondary school for not less than five years. There should be adequate provision of stipends to other students, covering about 25 per cent of the enrolment. They should be supplemented by loan scholarships, available on an adequate scale. One-tenth of the loan should be written off for every year of service as a teacher after training.

(4) Secondary training institutions do not attract students holding 'good' degrees (*i.e.*, first class and high second class in important subjects) in adequate numbers. Even in the best training institutions, they are less than 20 per cent and in most institutions, they form only a very small minority. Attempts should be made to attract first and good second class students each of whom should be given an adequate scholarship to cover the total costs of training.

4.44. **Facilities.** Hostel accommodation is usually provided for about 25 per cent of students and residential accommodation for at least the principal and one member of the staff. We recommend that hostel facilities should be substantially increased, and residential accommodation for at least half the staff should be provided. This will be all the more necessary when big institutions are established and in rural areas. The provision of other facilities, *e.g.*, libraries, laboratories, audio-visual aids and workshops or craftrooms is far from satisfactory. An intensive effort will have to be made to improve them.

4.45. **Improvement of Institutions for Primary Teachers.** The condition of training institutions for primary teachers is very depressing and their standards even more unsatisfactory than those of secondary training institutions. A supreme effort is needed, on a high priority basis, to improve the situation.

4.46. **Staff.** The majority of the staff is recruited from among teachers of secondary schools. These have naturally been trained for work at the secondary stage and are, in consequence, inadequately trained for preparing teachers for primary schools.

Their pay scales correspond to those of secondary school teachers and are often lower than those prevailing in higher secondary schools. Good secondary teachers are not prepared to work in primary training institutions because of the loss of private tuitions and because the work-load is extremely heavy. Some of the staff of these institutions is drawn from the inspectorate. Even in these cases, good inspecting officers with prospects before them are not attracted. These difficulties will largely disappear when the status of these institutions is upgraded to collegiate standard. We recommend that the staff should hold, besides the B.Ed. degree, a master's degree either in education or in an academic subject and should be entitled to receive the same scales of salary as lecturers in arts and science colleges, with two advance increments in recognition of their professional training. We also recommend that the staff of these training institutions should be adequately trained for their work of preparing primary teachers through special orientation or induction courses which should include experience of primary school work. We welcome the programme initiated by State Institutes of Education for this purpose.

4.47. **Students.** The general education of primary teachers is far less satisfactory than that of the secondary teachers. This will be seen from Table 4.1 and chart on page 80

4.48. It will be seen that qualified teachers (*i.e.* graduates and those who have completed the secondary school course) formed only 10.3 per cent of the total number of teachers in the lower primary schools in 1950-51 and this proportion increased to 51.0 per cent only in 1965-66. In the higher primary schools, the proportion of qualified teachers rose from 47.2 per cent in 1950-51 to only 60.0 per cent in 1965-66. The number of unqualified teachers is thus being reduced very slowly. At the present rate, it may take another 20-25 years to ensure that every primary teacher has had at least ten years of general education.

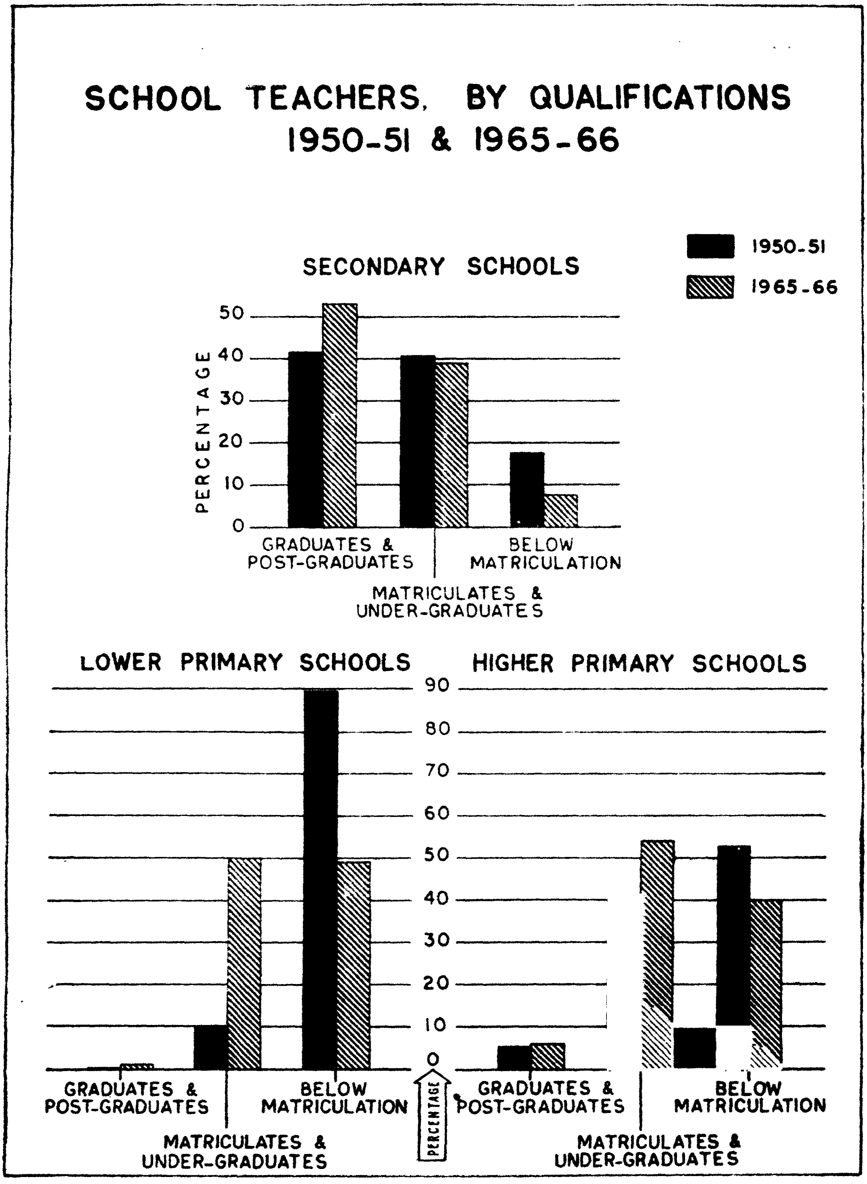
4.49. This slow progress is due to two main reasons: The first is that new recruitment is not strictly limited to those who have completed the secondary school, partly because such teachers are not available in certain areas (*e.g.*, tribal localities), partly for social considerations (*e.g.*, recruitment of women teachers or teachers from backward classes), and partly for financial considerations—unqualified teachers cost

TABLE 4.1. GENERAL EDUCATION OF PRIMARY TEACHERS (1950-51 to 1965-66)

Year	Graduates and above	Completed secondary school and under-graduates	Not completed secondary school	All teachers
LOWER PRIMARY SCHOOLS				
1950-51				
Men	898 (0·2)	44,730 (9·8)	410,009 (90·0)	455,637 (100)
Women	410 (0·5)	9,670 (11·8)	72,201 (87·7)	82,281 (100)
TOTAL	1,308 (0·3)	54,400 (10·1)	482,210 (89·6)	537,918 (100)
1965-66 (*estimated*)				
Men	7,100 (0·8)	430,650 (50·7)	412,250 (48·5)	850,000 (100)
Women	3,400 (1·7)	94,350 (47·2)	102,250 (51·1)	200,000 (100)
TOTAL	10,500 (1·0)	525,000 (50·0)	514,500 (49·0)	1,050,000 (100)
HIGHER PRIMARY SCHOOLS				
1950-51				
Men	3,920 (5·4)	31,267 (43·1)	37,422 (51·5)	72,609 (100)
Women	887 (6·9)	4,323 (33·5)	7,677 (59·6)	12,887 (100)
TOTAL	4,807 (5·6)	35,590 (41·6)	45,099 (52·8)	85,496 (100)
1965-66 (*estimated*)				
Men	23,500 (6·2)	212,200 (55·8)	144,300 (38·0)	380,000 (100)
Women	7,700 (5·5)	68,600 (49·0)	63,700 (45·5)	140,000 (100)
TOTAL	31,200 (6·0)	280,800 (54·0)	208,400 (40·0)	520,000 (100)

Source. Statistics published by the Ministry of Education. Those for 1965-66 are estimates made in the Commission Secretariat.

N.B. The figures within brackets give percentages to total.



SCHOOL TEACHERS, BY QUALIFICATIONS
1950-51 & 1965-66

less.[1] The second and the more important reason is that no attempt has been made to upgrade the qualifications of teachers in service. Since rapid improvements are needed, we make the following recommendations:

(1) All new appointments of primary teachers should be restricted to those who have had at least ten years of general education. Exceptions should be made, if qualified persons are not available, only in the case of women teachers or teachers for tribal areas.

(2) Far greater emphasis should be placed on helping unqualified teachers in service to improve their qualifications by providing correspondence courses and allowing liberal concessions for study leave.

4.50. Mainly because of the large diversity in the general education of primary teachers (their qualifications vary from a few M.As. and B.As. at one end to non-completion of even primary school at the other), several types of courses have to be organized, depending upon the level of general education of the teachers. Instead of doing so, teachers with very different qualifications (*e.g.*, matriculates and those who have passed the higher primary course only) are sometimes grouped together in the same class or course. This should be avoided.

4.51. **Other Facilities.** In primary training institutions, except in institutions located in big cities, hostel accommodation is required for 80 per cent of the students. Residential accommodation for staff is not provided on an adequate scale at present, the minimum provision generally being for the principal and one member of the staff. Other facilities such as libraries, laboratories, and audio-visual aids are very poor. We recommend a substantial improvement in all these matters on a high priority basis.

4.52. **Tuition Fees.** Tuition fees in all training institutions should be abolished.

4.53. **Demonstration or Experimental Schools.** All training institutions should have a demonstration or experimental school which will be used for demonstrations or special studies.

4.54. **Expansion of Training Facilities.** The magnitute of this problem varies largely from State to State as will be seen from Table 4.2.

TABLE 4.2. NUMBER AND PERCENTAGE OF TRAINED TEACHERS IN THE STATES (1965-66)

Name of State	Total number of teachers and percentage		
	Secondary stage	Higher primary stage	Lower primary stage
1. Andhra Pradesh .	34,215 (82.4)	15,625 (80.5)	86,501 (90.0)
2. Assam. . .	9,210 (18.6)	14,810 (22.4)	37,500 (55.0)
3. Bihar . . .	24,398 (50.2)	32,918 (72.5)	99,663 (82.7)
4. Gujarat . .	22,290 (66.4)	83,640 (61.4)	Included under higher primary
5. Jammu & Kashmir	4,613 a (25.6)	3,467 a (54.2)	4,874 a (54.0)
6. Kerala . .	22,031 (89.0)	39,406 (82.7)	59,703 (93.0)
7. Madhya Pradesh .	19,7006 (69.0)	27,961 b (72.0)	67,9096 (80.0)
8. Madras c . .	48,194 b (86.3)	59,440 b (93.1)	76,638 b (96.7)
9. Maharashtra .	48,590 (71.4)	151,500 (74.8)	Included under higher primary
10. Mysore . .	10,334 (59.5)	91,952 (59.9)	Included under higher primary
11. Nagaland . .	309 (15.9)	745 (8.7)	1,764 (20.3)
12. Orissa. . .	8,461 b (52.0)	10,322 b (31.0)	48,339 b (60.0)
13. Punjab . .	26,234 b (96.0)	14,911 b (88.0)	34,863 b (89.0)
14. Rajasthan . .	12,671 b (60.0)	18,352 b (71.0)	41,600 (75.0)
15. Uttar Pradesh .	33,311 (81.9)	46,819 (87.1)	162,472 (73.5)
16. West Bengal d .	40,238 (35.6)	12,041 (16.3)	98,306 (38.3)

Source. Furnished by Directors of Education.

N.B. Figures in parentheses indicate the percentages of trained teachers.

a. Figures relate to 1961-62. Taken from the memoranda of the State Government to the Education Commission.

b. Figures are estimated.

c. Figures relate to 1964-65.

d. Figures relate to 1963-64.

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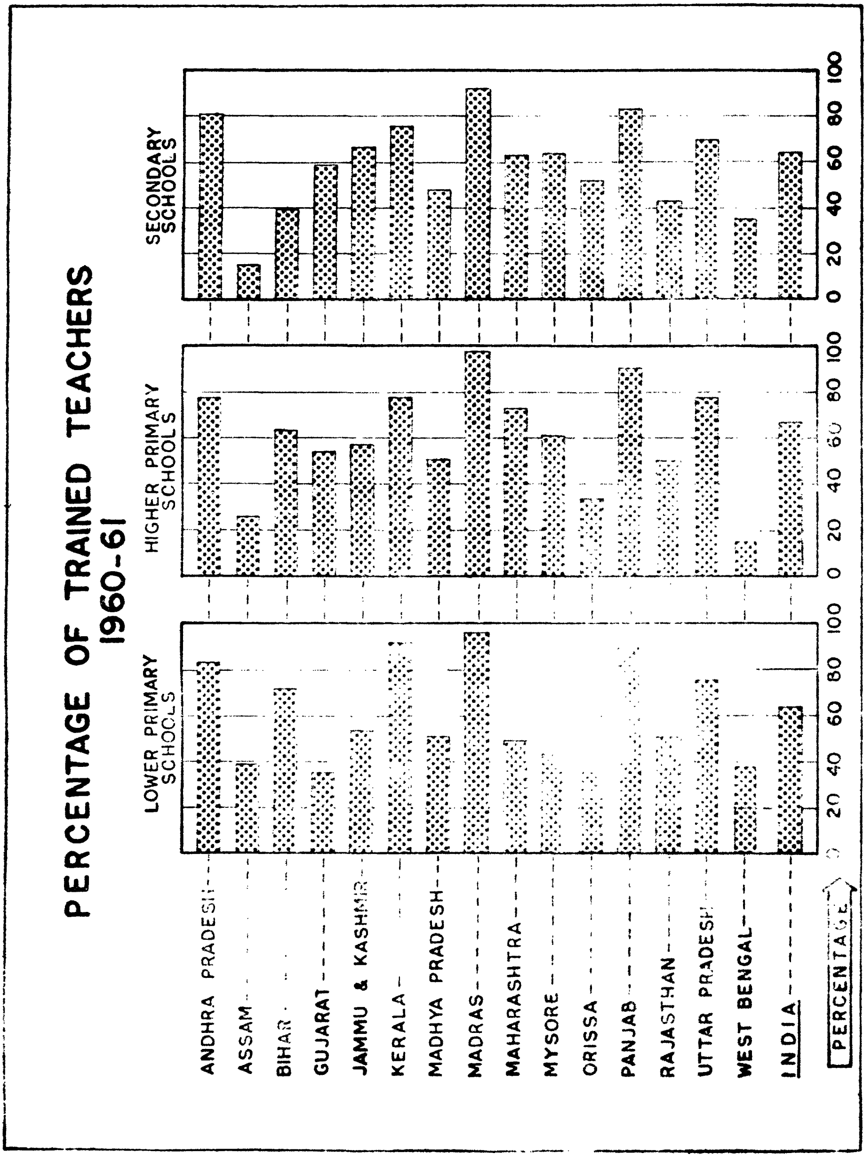
[1] At present, about 75 per cent of all the new recruitment at this stage is that of qualified teachers.



PERCENTAGE OF TRAINED TEACHERS 1960-61

States like Madras, Kerala and Punjab have a very large proportion of trained teachers at all stages and adequate facilities for teacher education. Others like West Bengal or Assam, have a low percentage of trained teachers and inadequate training facilities at all stages. At the secondary stage, the duration is uniformly one year in all parts of the country; but at the primary stage, the duration is one year in nine States, one year plus six months of field work in one State, and only two years in six States.

The chart on page 82 shows the percentage of trained teachers in different States in 1960-61.

During the next 20 years, large-scale expansion of training facilities will be needed to cope with the expansion of enrolments at the school stage, the lengthening of the duration of the training course for primary teachers, and the need to ensure that every teacher in a primary or a secondary school is either already trained at the time of his appointment or receives such training within three years. It would, therefore, be necessary for each State to prepare a plan for the expansion of training facilities after taking into consideration all relevant factors including the need for in-service education.

In preparing these plans, the following points should be kept in view.

(1) *Expansion of Facilities.* The objective should be to so expand training facilities that, by the end of the fourth plan, the output of trained teachers in any given year would be equal to the demand for additional teachers in the following year.

(2) *Part-time Facilities.* As large a part as possible of the total training facilities needed should be provided in full-time training institutions of large size. However, as the capital costs of this programme are very heavy, it may not be possible to provide all the facilities needed on a whole-time basis. The policy to be adopted, therefore, should be to ensure that the quality of full-time institutions is not diluted and that supplementary facilities are provided through such measures as the following:

(a) CORRESPONDENCE EDUCATION. In each State, at least one centre for correspondence education should be established, preferable in the State Institute of Education. It should prove pre-service and, in addition offer courses of in-service education for all teachers.

(b) EVENING OR PART-TIME COURSES. In all big cities of 100,000 or more, the number of teachers would be large enough to justify the institution of part-time or evening courses. Those facilities would be of great value in clearing the backlog of untrained teachers.

(3) *Clearance of Backlog.* Another important objective of the plan should be to clear up the backlog of untrained teachers as early as possible, preferably within a period of five years. We collected data from 29 districts about the age-wise breakup of untrained teachers according to age-groups and the results are given in Table 4.3.

TABLE 4.3. UNTRAINED TEACHERS BY AGE-GROUP (1965)

Age	Percentage of untrained teahers in the age-group					
	Lower primary schools		Higher primary schools		Secondary schools	
	Men	Women	Men	Women	Men	Women
Below 20	8·9	11·9	11·0	9·0	2·9	2·5
21—25	40·7	31·7	30·1	30·3	40·3	51·0
26—30	23·2	23·8	26·9	27·6	29·8	30·6
31—35	11·6	13·7	13·7	15·3	12·7	8·8
36—40	6·5	7·9	8·9	8·6	7·8	4·0
41—45	3·7	5·0	4·0	4·5	2·6	1·6
46—50	2·4	3·1	2·5	2·7	1·6	0·9
51—55	1·9	2·2	1·9	1·2	1·2	0·2
56—60	0·9	0·7	0·9	0·6	0·9	0·5
Above 60	0·2	..	0·1	0·2	0·2	..
TOTAL PERCENTAGE	100·0	100·0	100·0	100·0	100·0	100·0

Source. Data supplied by State Governments.

It will be seen that the bulk of the untrained teachers are below the age of 30 years. The proportion of teachers above the age of 40 years is comparatively very small. It would, therefore, be desirable to relate the policies with regard to the training of these teachers, partly to their age and partly to the total service they have put in. From this point of view, we make the following recommendations:

(a) There is hardly any purpose in compelling teachers above the age of 40 years to undergo the full period of training. We recommend that, if they have had at least five years of service, they may be given only a short course and deemed trained.

(b) Teachers below 40 years of age, who have put in at least 5 years of service, need not be required to undergo the full training course. A shorter course, specially designed for the purpose, would be adequate.

(c) Teachers below the age of 40 years, who have put in less than 5 years of service should, however, be required to undergo the full training course of one or two years. It would, of course, be open to these teachers to take this training either in full-time courses or through part-time and correspondence courses, in accordance with the arrangements made.

In our opinion, a flexible programme of this type would make it possible to clear the back-log of untrained teachers more quickly.

(4) *Size of the Institutions*. With a view to ensuring economy and efficiency, training institutions should be of a fairly large size. The minimum size of a training institution at the primary stage offering a two-year course should be 240 and that at the secondary stage should be 200. Existing institutions should be raised to this size, in a programme of about five years, by expansion and/or amalgamation. With regard to new institutoins which are proposed to be established, the minimum size should not be less than 400. The classes for the training of primary teachers attached to secondary schools as well as teacher education departments attached to colleges of arts and science, should be abolished and replaced by large-sized training institutions.

(5) *Location*. In planning the existing training facilities for teachers, it is necessary to pay attention to a number of factors. A certain proportion of the institutions, especially those at the primary stage, will have to be located in rural areas and the practice teaching of the teachers suitably arranged in the schools in the neighbourhood. It would also be of great assistance to break the isolation of teacher training if the responsibility for a teacher training programme is accepted by a variety of institutions. For instance, we would very much like an IIT to start a teacher training wing as a part of its programme. The same could be done by the agricultural universities. Programmes of this type will give a status and a broader basis for the training of teachers. Besides, this will also help to give education an orientation to agriculture and industry.

CONTINUING PROFESSIONAL EDUCATION OF TEACHERS

4.55. **The Role of the School.** In all professions there is a need to provide further training and special courses of study, on a continuing basis, after initial professional preparation. The need is most urgent in the teaching profession because of the rapid advance in all fields of knowledge and continuing evolution of pedagogical theory and practice. The programme will have to be developed through a number of agencies. The first is the school itself which must provide opportunities to the new teacher to learn from his experience and through consultation and discussion with experienced teachers in the school. The head and the senior teachers have a special role to play in providing guidance to the new teacher through planning his work and through organizing suitable activities such as staff study circles and discussion groups. Education Departments, training colleges and teachers' organizations can also play a significant role in this programme.

4.56. **Part-time and Whole-time In-service Education.** Apart from what the schools and other agencies can do, there is need for the organization of a large scale, systematic and coordinated programme of in-service education, so that every teacher would be able to receive at least two or three months of in-service education in every five years of service. The curriculum of these programmes should be planned and organized systematically, materials being developed with great care and the staff in charge being properly oriented. Good textbooks and source books, audio-visual material and children's work should be exhibited. This can be done only if, over a period of 10-15 years, every training institution—pre-primary, primary and secondary—is staffed and equipped to take up extension work, institutes an advisory service for teachers, and organizes in-service training programmes such as refresher courses, seminars, workshops and summer institutes. Every training institution should work on a 12-month basis with proportionate provision for additional staff and facilities. In addition, institutions that will carry out in-service work on a whole-time and continuing basis should be established.

4.57. **In-service Education of School Teachers.** Very little is being done for the in-service education of primary teachers. This programme needs great emphasis. With regard to secondary teachers, one of the most recent developments is the organization of summer institutes and the role played therein by the universities. These will have far-reaching consequences on the whole field of teacher education. The programme needs very large expansion and has to become an integral part of the annual work of the universities and schools. In this context, the following suggestions are made:

(1) Arrangements are needed for systematic follow-up after a long-term seminar, course or summer institute. The organizers and resource personnel should keep in touch with teachers who participate in the programmes, and teachers should report the new activities that have been undertaken, the results achieved and the difficulties met with. A news bulletin may be published to facilitate exchange of ideas or experiences.

(2) There should be active collaboration and coordination among the agencies concerned with in-service education and those responsible for school education. The impact of summer institutes organized during the last three years would have been stronger if the collaboration of the Education Departments and the Boards of Secondary Education had been available and modifications had been devised in the curricula, syllabuses and the external examinations to reflect the new trends.

(3) Continuing in-service education of teachers needs the support of research in education. The results of research should flow down to the classroom teacher and stimulate him for experimentation in his work. Similarly, the problems of the classroom must climb up to research institutions for an effective and practicable solution. This two-way traffic could be considerably stimulated by the summer institutes, and State Institutes of Education.

4.58. **Professional Preparation of Teachers in Higher Education.** The preparation of teachers for higher education is a responsibility of the universities themselves and recommendations on this subject are discussed in the chapters dealing with higher education. We confine our discussion here to their professional training.

4.59. There is at present no provision for the professional initiation of a university teacher. A lecturer is generally expected to take on his full load of teaching work—and sometimes even more—from the first day of his appointment. He generally receives no initiation into his duties and no orientation to his profession. He is given no time for adaptation and no chance to watch the good senior teachers taking their classes. He has no prescribed opportunity to study the syllabus, plan lectures, consult the head of his department or other senior colleagues about them, or to study the techniques of seminars and tutorial classes. He even lacks at times the knowledge of the mechanics of his profession and does not know how to set question papers or to mark answer books. In this atmosphere of almost total neglect, the new teacher is too often content to copy mechanically the methods and procedures adopted by his own teachers and inflict them on his students. Thus, by and large, the dull pointless tradition of 'giving lectures' and dictating notes has passed on from generation to generation. The incalculable loss involved in this unimaginative approach can and should be avoided.

4.60. The tradition in India has been to regard training for college lecturers as unnecessary. Born teachers who can dispense with training certainly exist. Many are keen, devoted scholars, whose scholarship may win over the respect of the students—though this is not always a safe presumption—and may thus be able to discharge their function satisfactorily in spite of professional inadequacy. But the bulk of teachers unfortunately do not fall into these categories. For them some suitable form of training and orientation is essential, not only to overcome their initial 'teaching' troubles and to create a sense of confidence, but also to give them a reasonable understanding of educational objectives and purposes, the *raison d'etre* and place of their special subject in the curriculum, of new methods and techniques of teaching and learning, and a knowledge of psychology on which good teaching should be based. No question of *amour propre* should be involved. In most highly skilled professions—and education is certainly one—training is regarded as an essential qualification.

4.61. We do not think it necessary, however, to propose that full-fledged training colleges should be established for college lecturers, though we do not rule out this possibility. For the present we suggest that universities, individually or co-operatively, give their mind to this problem and work out practicable methods of meeting the present situation. Some measures have in fact been taken in recent years. The UGC, for example, has started a scheme of summer institutes in which teachers of different subjects are brought together under the guidance of competent professors and scholars to study the new dimensions of their disciplines. Their number is increasing and it is hoped that many more will be organized. But they are not a complete answer to the problem. In a few colleges, special lecture courses have occasionally been organized for this purpose and have proved useful. Some universities have instituted special postgraduate diplomas to meet these needs. These, however, have only a marginal effect on a problem for which more massive and imaginative measures are needed.

4.62. A few suggestions are made here in the hope that universities will draw up their own programmes for the orientation of their teachers, taken these suggestions into consideration:

(1) Newly appointed lecturers should be given some time and opportunity to acclimatize themselves to the institution, to learn the traditions and pattern of work, to get to know their colleagues and students. They should be expected to study the syllabus carefully, to prepare a detailed programme for the teaching work they propose to undertake, to draw up their schemes of lectures, consult the library and select books to be recommended to students. They should discuss these with the heads of their departments or other senior colleagues and invite their suggestions. The head of a department who is not interested in this work and is not prepared to give new teachers his help, guidance and time is unworthy of his position.

(2) They should be encouraged to attend the lectures of some senior teachers of their subject and study their methods of teaching and ways of handling their students. After the lecture, the senior teacher can discuss his methods and techniques with his junior colleagues who should be free to express their opinions and raise questions. If this is done, they would not mind if later the head of the department or some other senior colleague visits their classes. It is wrong to think that such visits are derogatory and should be avoided. If the college community is a fellowship of learning, such inter-change of visits should be acceptable.

(3) Every university and, where possible, every college, should have regular orientation courses organized for a few weeks early in the session in which some new and some older teachers participate. The best teachers of the institution—as well as some distinguished teachers from outside—should discuss with them the outstanding problems of teaching, research and discipline as well as the mechanics of the profession. During such courses new teachers will be able to make social and academic contacts and find their feet in their new environment. They will learn to feel at home in the college, accept some of its ideals and traditions and come into contact with well-known teachers of their own institution and from outside. Care should be taken to associate with these courses only such persons as enjoy a high reputation in the academic community for their scholarship and character and are likely to exercise a beneficial influence on new members.

(4) It may be possible, in the bigger universities or a group of universities, to place these activities on a permanent and continuing basis by establishing something like a staff college where teachers from all affiliated and constituent colleges as well as the university will be brought together for orientation, discussions, seminars, workshops, etc. Where this is not possible, a conference centre would be necessary to

facilitate discussion of the issues which teachers have to face *e.g.*, objectives of education, methods of teaching, enrichment of subject-matter, etc. The staff college or conference centre should also produce, in cooperation with other members of the faculty, occasional brochures, book-lists, guidance materials, etc., of use to all teachers.

MAINTENANCE OF STANDARDS IN TEACHER EDUCATION

4.63. **Need for Organizations at the State and National Levels.** Institutions that prepare teachers for the primary and secondary schools show a bewildering variety of courses, conditions of work, and quality of teachers turned out. It is unfortunate that there is no organization, at the State or national level, for ensuring standards in teacher education. The need for such organizations is increasingly realized and a number of suggestions have been put forward. It has been proposed that the National Association of Teacher Educators, whose main concern is with the improvement of teacher education at all levels, may be entrusted with this responsibility. While we recognize the useful role this Association can play in raising standards in teacher education, and have, therefore, proposed its representation on the Standing Committee of the UGC whose role and functions are discussed later, we think that the Association, by itself, will not be able to fulfil this task. It has been suggested that special statutory organizations should be set up at both the national and State levels. We do not favour this idea also because such bodies will tend to isolate teacher education from general academic life. In our opinion, the UGC, on whom lies the responsibility for the maintenance of standards in higher education, should also be responsible for the maintenance of standards at the national level in teacher education and discharge it through its Standing Committee on Teacher Education discussed in paragraph 4.65. This will meet the principal objective of our proposals of bringing education within the main stream of university academic life. At the State level, raising of standards should be the responsibility of the State Boards of Teacher Education discussed earlier, working in collaboration with the UGC.

4.64. **The Role of the Centre.** Since teacher education is vital for improving standards in all education, the Government of India should assume a special responsibility for improving teacher education and providing liberal funds for it, both in the central and in the centrally-sponsored sectors. The expansion of the central sector can be done through the UGC and we recommend that a substantial allocation of funds should be made for teacher education in the fourth five year plan and placed at the disposal of the UGC. Such allocations will have to be increased and continued in later plans.

4.65. In order to discharge this responsibility adequately, the UGC should, in collaboration with the NCERT, set up a joint Standing Committee for Teacher Education. The Committee should consist of—

(1) Representatives of the UGC and the NCERT;

(2) Representatives of universities;

(3) Representatives of State Boards of Teacher Education by rotation;

(4) School teachers including at least one primary teacher;

(5) Representatives of teachers' organizations;

(6) Educationists; and

(7) A representative of the National Association of Teacher Educators.

The Standing Committee on Teacher Education should be concerned with all aspects of teacher education, general and professional, at both the undergraduate and post-graduate levels. It should have the power

— to develop and establish standards for training institutions and university departments;

— to coordinate and improve standards of teacher education at all levels;

— to advise universities and State Departments of Education regarding programmes, curricula, textbooks and qualifications of staff of training institutions at all levels;

— to grant funds to teachers' colleges, departments or schools of education in the universities;

— to arrange for periodical inspection of training institutions and university departments of education; and

- to develop and support financially, in cooperation with the universities or State Departments of Education, programmes for the in-service improvement of teacher-educators and teachers, both in subject-matter and in professional qualification and skill.

4.66. In addition to these programmes, the Government of India will have to provide liberal funds in the centrally-sponsored sector to assist State Governments to develop teacher education programmes on the lines recommended. Some of the special programmes that need emphasis are the upgrading of training institutions for primary teachers to the university standard, improvement programmes of training institutions at all levels, correspondence education, in-service education, and the establishment of training institutions of large size.

CHAPTER V

ENROLMENT AND MANPOWER

I. *A National Enrolment Policy.* (1)

II. *Enrolment Policies at Different Stages of Education.* (3) Increasing the educational level of citizens; (4) Provision of secondary and higher education; (5) Public demand for secondary and higher education; (9) Pool of ability; (10) Capacity to provide facilities; (11) Manpower needs; (13) A strategy of development.

III. *A Forecast of Manpower Needs.* (14) The ISI-LSE estimates; (15) Manpower (1961); (17) Future requirements of educated manpower; (21) Workers, stock and output of educated manpower; (25) Enrolments.

IV. *Educational Implications of the Estimates.* (27) Admissions to lower secondary education; (28) Admissions to higher secondary and university education; (32) Development of vocational education; (40) Enrolments and manpower; (41) Educational levels of the working force (1961-1986).

V. *Relating Manpower Estimates to Enrolments.* (44) Proposals of Shri R. A. Gopalaswami; (47) Machinery for manpower planning; (48) Relating manpower estimates to output of educational institutions—at the national and State levels.

VI. *General.* (49) Education and employment; (50) The need for a wider perspective.

5.01. **A National Enrolment Policy.** One of the major programmes in national reconstruction is the development of our human resources, and in this there can be no limit to the education to be provided. But in any given society and at a given time, the decisions regarding the type, quantity and quality of educational facilities depend partly upon the resources available and partly upon the social and political philosophy of the people. Poor and traditional societies are unable to develop even a programme of universal primary education. But rich and industrialized societies provide universal secondary education and expanding and broad-based programmes of higher and adult education. Feudal and aristocratic societies emphasize education for a few. But democratic and socialistic societies emphasize mass education and equalization of educational opportunities. The principal problem to be faced in the development of human resources, therefore, is precisely this: How can available resources be best deployed to secure the most beneficial form of educational development? How much education, of what type or level of quality, should society strive to provide and for whom?

5.02. India has committed herself to the creation of a democratic and socialistic pattern of society. The fundamental principles that should guide the provision of facilities at the different stages and sectors of education, therefore, may be stated as follows:

- —to provide effective general education of not less than seven years' duration to every child, on a free and compulsory basis, and to expand lower secondary education on as large a scale as possible;
- —to provide higher secondary and university education to those who are willing and qualified to receive such education, consistent with the demands for trained manpower and the need to maintain essential standards; and to provide adequate financial assistance to those who are economically handicapped;
- —to emphasize the development of professional, technical and vocational education and to prepare skilled personnel needed for the development of agriculture and industry;

—to identify talent and to help it grow to its full potential;

—to liquidate mass illiteracy and to provide an adequate programme of adult and continuing education; and

—to strive continuously to equalize educational opportunities, beginning with the elimination of at least some of the more glaring inequalities.

In this chapter, we shall briefly discuss some of the major implications of these policies.

ENROLMENT POLICIES AT DIFFERENT STAGES OF EDUCATION

5.03. **Increasing the Educational Level of Citizens.** In the next two decades the highest priority must be given to programmes aimed at raising the educational level of the average citizen. Such programmes are essential on grounds of social justice, for making democracy viable and for improving the productivity of the average worker in agriculture and industry. The most crucial of these programmes is to provide, as directed by Article 45 of the Constitution, free and compulsory education of good quality to all children up to the age of 14 years. In view of the immense human and physical resources needed, however, the implementation of this programme will have to be phased over a period of time. This can be done

—by providing five years of effective education to all children by 1975-76 and seven years of such education by 1985-86;

—by making part-time education for about one year compulsory for all children in the age-group 11-14 who have not completed the lower primary stage and are not attending schools. The aim will be to make these children functionally literate and stop all further additions to the ranks of adult illiterates; and

—by efforts to liquidate adult illiteracy.

The second and the third programmes are transitional. But the first needs great emphasis as the only permanent solution of the problem. We discuss the details of these programmes elsewhere.[1]

5.04. **Provision of Secondary and Higher Education.** Several complex problems relating to the amount, type and quality of education to be provided arise in respect of secondary and higher education. It is not easy to determine the size of total enrolments in the absence of clear and precise targets about overall expansion rates. Moreover, as education at these stages has to be diversified into a large number of courses to meet varied individual aptitudes as well as social requirements for trained manpower, it becomes even more difficult to decide the precise extent of provisions for each course. Unfortunately, an understanding of these problems is still limited. Enrolment policy must, therefore, be based on a pragmatic combination of four different criteria: the public demand for such education; the full development of the natural pool of ability; the capacity of the society to provide the educational facilities needed at given levels of quality; and manpower needs for national development.

5.05. **Public Demand for Secondary and Higher Education.** During recent years, the demand for secondary and higher education has increased enormously. There are several reasons for this such as:

—the traditional social status attached to a university degree;

—the growing hunger for education among the urban people and the middle classes who have realized that the best, and probably the only worthwhile legacy they can leave to their children, is to give them good education;

—the awakening among the rural people and the lower classes who are now seeking social advancement—just as the urban and middle classes did during the last hundred years—through education and government service;

— the disappearance of the old 'job values' attached to primary education which makes secondary education the 'minimum' and higher education the 'optimum' qualification for any worthwhile job;

—the absence of adequate employment opportunities for young persons so that many of them are forced to go in for secondary or university education simply because they have nothing else to do;

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[1] See Chapters VII and XVII.

—the increasing provision which is being made by State Governments for free secondary education and for the liberal grant of free studentships, stipends and scholarships at the university stage; and

—a rapid multiplication of educational institutions at this level which has made them easily accessible to young persons in thousands of small and out-of-the-way places.

5.06. This situation could have been met in two ways, either by expanding facilities in secondary and higher education strictly on the basis of available real resources in terms of teachers and materials and adopting a policy of selective admissions to bridge the gap between the public demand for such education and the facilities actually provided, or by adopting a policy of open-door access and providing all the resources needed to create the required facilities and to maintain them at the optimum level of efficiency. But as it was neither possible to resist the demand nor to raise all the needed resources, a compromise approach was attempted: the access to all secondary education was provided on an open-door basis; and in higher education, both the selective and open-door policies were operated upon simultaneously in different sectors.

5.07. This policy has had several undesirable consequences. As overall resources were limited and were absorbed in programmes of expansion of general education, it became impossible to pay adequate attention to programmes of qualitative improvement or vocationalization. Most of this expansion has also been non-egalitarian since secondary schools and colleges enrolled students who had access to them and who could afford the expenditure involved, although their preparation and motivation were often inadequate. On the other hand, they failed to enrol a large proportion of talented students who were prevented from studying further by social or economic handicaps. The benefits of expansion thus went largely to the privileged rather than to the under-privileged classes. Moreover, there grew up an imbalance between the development of general and vocational education, the former far exceeding demand and the latter generally falling much below it. Consequently, the output of matriculates and of graduates in arts and commerce was in excess of demand and created problems of educated unemployment while trained personnel for the development of agriculture, industry or research remained in short supply.

5.08. During the next two decades, the demand for secondary and higher education will increase still further as primary education becomes universal and the general economic conditions improve. Under these circumstances, a continuation of the earlier enrolment policies will merely accentuate these evils. It is, therefore, necessary to adopt some definite policy of 'selective admissions' so as to relate enrolments to facilities available and to maintain standards.

5.09. **The Pool of Ability.** Providing secondary and higher education to all the potentially able students generally sets up a very high target which even affluent societies find it difficult to achieve. It will be obviously beyond our reach, at least in the immediate future, in view of the limited resources available. This should, however, be the goal towards which we should continually move. In the transitional period, immediate effect should be given to one important implication of this policy, *viz.*, to ensure that all gifted students (at least the top 5-15 per cent of all students), who complete primary or secondary education are enabled to study further in institutions of secondary (or higher) education. For this purpose, it will be necessary to provide a large number of scholarships on the lines to be discussed later.[1]

5.10. **Capacity to Provide Facilities.** In planning enrolment facilities, it is essential to take into consideration the real resources available and the capacity of the society to create the educational facilities needed or in demand. There are internal constraints in every educational system which limit expansion of facilities, especially in secondary and higher education. These are the availability of competent teachers, of physical plant and of finance. Even in affluent societies, these built-in constraints make it almost impossible to provide all those facilities, quantitatively and qualitatively, which would be required on the basis of public demand or for the development of the total pool of ability. This is all the more so in a developing economy like our own. In trying to meet the pressures of the public demand, these constraints are often overcome by diluting standards. There are many instances where institutions have been started without the necessary teachers being available, without the needed equipment and without adequate financial allocations. This all too common practice must be resisted in the larger interests of the country. If a society does not have the resources to meet the entire public demand for secondary and higher education, that is really unfortunate; but it would be tragic if this limitation was ignored and educational standards were thrown in complete jeopardy.

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[1] See Chapter VI.

5.11. **Manpower Needs.** We would also like to stress the need to pay due attention to the relationship between enrolment and manpower requirements. If India is to achieve its targets of economic growth, it must have an adequate supply of educated specialists for each category of job to be performed. Conversely, if there is an excess of trained people in any category, it implies an imprudent use of scarce resources and also creates difficult problems of unemployment of the educated. Even from the point of view of the individual, some matching of educational patterns and job opportunities is vital. Nothing is more frustrating than to be under-qualified or over-qualified for a job, or to be unemployed because there is no call for one's qualifications. We believe, therefore, that estimates of future manpower needs form a useful basis for regulating enrolment patterns above the primary level.

5.12. This broad recommendation of relating the provision of educational facilities in secondary and higher education to estimated manpower needs has to be understood in the light of some general reservations. Manpower forecasting is not a precise operation because of the large number of imponderables involved. It is, therefore, necessary to make a continuous effort to improve the collection of necessary data and the techniques of forecasting. This should be done regularly by the Central and State Governments. As manpower forecasts are ordinarily expressed in quantitative terms, the expansion of educational facilities tends to receive undue emphasis in translating them into enrolment terms. It is, therefore, essential to emphasize the quality of manpower produced because economic growth can be hindered rather than accelerated if appropriate standards are not maintained. Moreover, manpower needs cannot be the only criterion for regulating the provision of facilities. Before final decisions are taken, its indications will have to be checked with the conclusions drawn from calculations based on the other criteria. However, even after making due allowance for these limitations, estimated manpower needs provide four broad indications in terms of magnitudes, *e.g.*, the total enrolments needed in secondary and higher education; enrolments needed in different types of courses; shortages and surpluses in the manpower situation; and priorities involved.

5.13. **A Strategy of Development.** It will be seen from the foregoing discussion that the minimum level of expansion is provided by the capacity to expand facilities in terms of real resources and that the public demand for secondary and higher education as well as the need to develop the available pool of talent to the fullest extent possible generally set high targets which are difficult to be realized in the immediate future. The gap between these high and low targets can be bridged by considerations which emerge from manpower needs and equalization of educational opportunities. These will indicate the priorities to be adopted, the different courses of study to be developed, the extent to which facilities should be provided in the different courses and the manner in which enrolments in them could be made to include at least the best students in the community.

A FORECAST OF MANPOWER NEEDS

5.14. **The ISI-LSE Estimates.** We have recommended that educational facilities at the post-primary stage should be broadly related to manpower needs. Our task now is to forecast these needs and study their educational implications. In this, we have been fortunate in having two estimates prepared for us: one, a series of elaborate investigations carried out by the Institute of Applied Manpower Research; and the other, a part of a longer study undertaken by the Planning Unit of the Indian Statistical Institute, New Delhi, and the Unit for Economic and Statistical Studies on Higher Education, London School of Economics, in collaboration with the Perspective Planning Division of the Planning Commission. In broad orders of magnitude, the results of the two estimates are similar; and the differences between them can generally be explained by the different assumptions used. For the main presentation of this chapter, we adopt the ISI|LSE estimates as they are more detailed, offer estimates up to 1986 and assume a higher target of economic growth.[1] We believe that the risk involved in over-estimation is comparatively less than in under-estimation and that it is less harmful to have some surplus trained personnel on hand for some time rather than hold up the progress of agriculture or industry for lack of such personnel. At any rate, precise figures are less important than broad directions of policy. On this, both estimates largely agree.

5.15. **Manpower (1961).** We must first explain briefly the manner in which these estimates have been made. The starting point in the preparation of these estimates is provided by the country's stock of educated manpower in 1961 (derived from the 1961 Census and a special tabulation of the National Sample Survey, 16th round), expressed in terms of workers with matriculate, intermediate and degree qualifications. This is shown in Table 5.1.

TABLE 5.1. MATRICULATES, INTERMEDIATES, GRADUATES AND TOTAL WORKERS, BY INDUSTRY : INDIA (1961)

(Thousands)

Industry group	Below Matric	Matriculates	Intermediates	Graduates	Total Workers
1. Agriculure	130,648	381	46	67	131,142
2. Mining, etc.	5,143	68	5	6	5,222
3. Manufacturing	19,377	436	89	104	20,006
4. Construction	1,911	99	30	19	2,059
5. Trade & Commerce	7,009	452	101	92	7,654
6. Transport and Communications	2,528	318	80	93	3,019
7. Services (Other	*16,895*	*1,509*	*405*	*765*	*19,574*
Public services	3,711	722	245	296	4,974
Educational services	1,584	467	103	289	2,443
Medical and health services	765	124	27	48	964
Religious and welfare services	1,082	38	6	26	1,152
Legal services	119	39	1	60	219
Business, trade, labour association and community services	191	37	6	7	241
Recreation, personal and other services	9,443	81	18	37	9,579
TOTAL	183,511	3,262	756	1,147	188,676
				(Percentage)	
1. Agriculture	99·6	0.3	..	0·1	100·0
2. Mining, etc.	98·5	1·3	0·1	0·1	100·0
3. Manufacturing	96·9	2·2	0·4	0·5	100·0
4. Construction	92·8	4·8	1·5	0·9	100·0
5. Trade & Commerce	91·6	5·9	1·3	1·2	100·0
6. Transport and Communications	83·7	10·5	2·7	3·1	100·0
7. Services (Other)	86·3	7·7	2·1	3·9	100·0
TOTAL	97·3	1·7	0·4	0·6	100·0

Source. ISI/LSE Paper.

Note. The totals do not tally on account of rounding.

5.16. Broadly, there were 5·2 million workers with qualifications equivalent to matriculation and above, two-thirds of them in towns and the rest in rural areas. Over half of these were employed in 'other' services (public administration, education and so on). About one in five of them (1·1 million) were also graduates, and these were even more heavily concentrated in the service occupations. Only some 100,000 were in manufacturing industries.

5.17. **Future Requirements of Educated Manpower.** The question we must ask is how these numbers may be required to grow in the future. How many matriculate and graduate workers should there be in 1976 and 1986? Two broad methods have been used to answer these questions, one for services, in which many educated people are employed, and one for the other sectors of the economy.

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[1] For details, see paper on the subject included in Supplementary Volume I, Part V.

5.18. To take the latter first, it has been assumed that, as net output in each sector and in each branch of manufacturing industries increases, so proportionately will be the employment of educated manpower. The targets for economic growth assumed in these estimates, for the economy as a whole and for each sector, are those proposed by the Perspective Planning Division of the Planning Commission. The overall growth targets are 6·6 per cent a year from 1961 to 1976 and 7·0 per cent for the whole period of 1961 to 1986. Within these overall targets, sectoral targets naturally vary—from 11·85 per cent (factory establishments including power supply) and 11·24 per cent (construction) to 3·86 per cent (agriculture) in the period 1961-76. Projecting the growth of output in each separately allows for shifts in patterns of employment and reveals demands for educated workers in fast-growing highly technical industries which would be lost in a simple overall growth rate.

5.19. Within services, each major service has been treated separately. In 1961, a quarter of employed matriculates and a similar proportion of employed graduates were in public administration and defence. It is assumed that these will increase at four per cent a year. The need for teachers is derived from enrolment estimates and assumptions about pupil-teacher ratios and teachers' qualifications. The need for medical personnel distinguishes doctors, nurses and auxiliary personnel. The targets chosen imply one doctor per 3,000 population in 1976-76 and one per 2,000 in 1985-86, and similar numbers of fully trained nurses. The estimates for both educational and medical personnel take direct account of population growth and national income. Of the remaining services, legal and business services may grow as fast as the economy as a whole; recreational and personal services perhaps less fast. For the combined remaining services, a growth of 3 per cent a year has been assumed up to 1976 and of 5 per cent thereafter.

5.20. The results of these various calculations show that matriculate workers should increase from 5·2 million in 1961 to 16·6 million in 1976 and 32·6 million in 1986. Graduate workers should increase from 1·1 million in 1961 to 3.3 million in 1976 and 6:5 million in 1986. This and other relevant details will be seen from Table 5.2.

TABLE 5·2. ESTIMATED REQUIREMENT OF MATRICULATES AND ABOVE BY INDUSTRY GROUP : INDIA (1960-61 to 1985-86)

(Thousands)

Industry Group	1960-61 (actual)			1975-76			1985-86		
	Matriculate	Intermediate	Graduate	Matriculate	Intermediate	Graduate	Matriculate	Intermediate	Graduate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. Agriculture	381	46	67	681	83	120	984	120	174
2. Mining	67	5	6	282	20	27	632	45	61
3. Manufacturing	436	90	102	2,880	584	707	6,681	1,355	1,642
4. Construction	99	30	19	503	150	97	1,131	337	218
5. Trade and commerce	452	100	92	1,181	262	240	2,565	570	522
6. Transport and Communications	318	80	94	1,200	301	354	2,608	654	769
7. Services (Other)	*1,509*	*404*	*765*	*4,147*	*1,040*	*1,754*	6,677	*1,653*	*3,156*
Public services	723	245	296	1,299	441	533	1,923	652	789
Educational services	467	102	290	2,123	463	877	3.041	668	1,728
Medical and health	124	27	47	379	82	175	1,139	248	360
Other services	195	30	132	357	54	169	574	85	279
TOTAL	3,262	755	1,146	10,874	2,440	3,299	21,278	4,734	6,542

Source. I S I /L S E Paper.

5.21. **Workers, Stock and Output of Educated Manpower.** So far, these projections have been in terms of numbers of *workers*. But not all educated people work. Some remain students, some are house-wives and some remain unemployed. Broadly speaking, it has been assumed that the proportion of educated men and women who are at work will remain the same as it was in 1961. On this basis, the stocks of workers (as well as the out-turn in each category) were worked out and are given in Table 5.3. It will be seen from it that the *total* number of those with matriculation and above grows from 8 million in 1961 to 27 million in 1976 and 56 million in 1986 (or at the rate of 8.3 per cent a year up to 1976 and 7·5 per cent in the following decade). The total number of graduates shown grows from 1·5 million in 1961 to 4·5 million in 1976 and 9 million in 1986 (or at a steady growth rate of 7:5 per cent a year, compared with 6 per cent throughout the 1950s).

TABLE 5·3. ESTIMATES OF REQUIRED WORKERS, STOCK AND OUT-TURN OF MATRICULATES AND ABOVE : INDIA (1960-61 to 1985-86)

	Thousands			Annual Growth Rate		
	1961	1976	1986	1961-76	1976-86	1961-86
Matriculates and above						
Workers	5,164	16,612	32,554	8·1	7·0	7·7
Total stock	8,227	27,339	56,223	8·3	7·5	8·0
Out-turn of matriculates	623 (6·8)	2,324 (16·4)	4,779 (27·4)	9·2	7·5	8·5
Intermediates and above						
Workers	1,901	5,739	11,275	7·6	7·0	7·4
Total stock	2,755	8,515	17,464	7·8	7·6	7·6
Out-turn of intermediates	240 (2·8)	749 (5·6)	1,537 (9·1)	7·9	7·5	7·7
Graduates and above						
Workers	1,146	3,299	6,543	7·4	7·1	7·2
Total stock	1,510	4,433	9,082	7·5	7·4	7·5
Out-turn of graduates	123 (1·5)	377 (3·2)	772 (4·9)	7·7	7·5	7·6

Source. ISI/LSE Paper.

N. B. Figures in parentheses indicate percentages of the population in the corresponding age-groups.

5.22. In general, the output from the educational system needed to produce this pattern of stocks should grow at the same rate as the required stock. The exception is the output of matriculates up to 1976, which grows rather faster than the required stock as the actual output in 1961 was below that required if stock targets were to be met. Overall, the annual output of matriculates should grow from 0·6 million in 1961 to 4.8 million in 1986 and that of graduates from 0·1 million to nearly 0·8 million. The percentage of each age-group who matriculate, should rise from 7 per cent to 27 per cent and those who graduate from 1.5 per cent to nearly 5 per cent.

5.23. On the other hand, the *proportion* of those completing Class VII who go on to be matriculates and graduates must fall. This is because of the very substantial expansion of numbers in Class VII as the Constitutional Directive on free and compulsory education is implemented. If the transition proportions (that is, those matriculating and graduating as a percentage of those in Class VII) remain fixed even when all children complete Class VII, the stocks of educated manpower would be well in excess of manpower needs. This would become especially serious from mid-1970s onwards: by 1986 there would be 4 million 'too many' matriculates and 1·5 million 'too many' graduates.

5.24. In addition to these estimates for workers with broad educational levels, separate estimates have been made for engineers and agricultural graduates. These will be discussed elsewhere.[1] When graduates in engineering and agriculture are taken with those in medicine and teaching and related to the total stock of graduates, they form an increasing proportion—33 per cent in 1961, 43 per cent in 1976 and 46 per cent in 1986. Comparable changes are required at lower levels.

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[1] Chapters XII, XIV and XV.

5.25. **Enrolments**. The final stage in the calculation is to say what enrolments are implied by the out-turns required. This has been done on the basis of these observed relationships between enrolments and out-turns in 1960-61, allowance being made for our recommendations on the pattern of education, length of courses, wastages, etc. The net result is given in Table 5.4.

TABLE 5·4. ENROLMENTS PROPOSED (1960-61 To 1985-86)

(Thousands)

	1960-61		1975-76		1985-86	
	Enrolments	Passes	Enrolments	Passes	Enrolments	Passes
Matriculation level						
General : Classes VIII/IX, IX/X, X/XI	3,582	585	12,324	2,324	23,630	4,779
Vocational (school) [1,2]	119	48	361	135	738	278
TOTAL MATRICULATES	3,701	633	12,685	2,459	24,368	5,057
Intermediate level						
General : Years I and II degree course[5]	597	208	..	..	..	..
College (professional)	80	35	..	..	..	..
TOTAL COLLEGE	677	243	2,176	749	4,460	1,537
School (vocational)						
Engineering Diploma	46	10	297	67	573	139
Others	181	42	701	151	1,438	310
Teacher Training [1,4] (all non-graduate)	123	75	453	211	402	169
TOAL SCHOOL[1]	350	127	1,451	429	2,413	618
TOTAL INTERMEDIATE	1,072	370	3,627	1,178	6,873	2,155
Undergraduate level						
First degree : Years I, II, III and IV	822	96	..	..	..	..
Professional[3]	174	30	..	..	..	..
TOTAL	996	126	3,038	377	6,216	772
TOTAL (ENROLMENTS IN[6] YEARS III, IV ONLY)	320	126	972	377	2,985	772

Source ISI/LSE **Paper.**

Notes.

1 Not represented in the manpower data.

2 Including some teacher training, 1960-61 only.

3 First degree only (excluding degree in teaching and law).

4 Excluding courses at matriculate level in 1960-61.

5 Enrolment in Classes XI and /or XII and intermediate and equivalent classes.

6 In 1985-86 the enrolment figure is based upon three-year course and thus represents enrolments in Years III, IV and V.

EDUCATIONAL IMPLICATIONS OF THE ESTIMATES

5.26. We broadly accept these forecasts subject to periodical revision, as a basis for a national enrolment policy and invite attention to the main conclusion they indicate with regard to future educational development. These are:

- —to restrict the unplanned and uncontrolled expansion of general secondary and higher education, if massive educated unemployment is to be avoided;
- —to make special and intensive efforts to vocationalize secondary education and to develop professional education at the university stage; and
- to devise suitable machinery, at both the national and State levels, which will relate the estimates of manpower needs effectively to the output of the educational system so that, by and large, there is some assurance that a suitably trained person would be available for every job to be done and every educated person would find a job appropriate for his education and professional training.

We shall now examine these conclusions briefly.

5.27. **Admissions to Lower Secondary Education.** In order to restrict unplanned and uncontrolled expansion of secondary and higher education, it is necessary to restrict the provision for places in accordance with manpower estimates and wherever the applicants for admission exceed the places, to make the admissions on a selective basis. At the lower secondary stage, however, which is to be regarded as completion of general education, emphasis should *not* be laid on 'selection' in the sense of admitting the 'fit' students and weeding out the 'unfit'. At this level, selection should be oriented more towards 'testing and guidance' than towards 'elimination'. Its main objective should be to enable a student to know his own level of achievement and his potentialities and to decide whether it would be *in his interest* to leave the school and enter the world of work, or to join a particular vocational course, or to continue in the stream of general education. In other words, 'selection' at this stage will be mostly 'self-selection' helped through a testing and guidance service. This service should be available to all schools in all areas, irrespective of the level of expansion of secondary education.[1] Whether a system of more rigorous selections is needed or not in a particular area is a matter for local decision and will depend upon the needs for manpower in the area and the level of expansion already reached.

5.28. **Admissions to Higher Secondary and University Education.** Beyond the lower secondary stage, a system of selective admissions becomes inescapable in view of the limited resources available. This idea is gaining much wider support but is still opposed on certain socio-economic grounds. It is argued, for instance, that this policy would adversely affect access to higher education of the backward classes, the rural areas and under-privileged groups now entering higher education for the first time. These fears have some justification. But the remedy is not to be sought in the continuance of the present policy of open-door access. The under-privileged sections have a very small and disproportionate share in existing facilities in spite of the unrestricted admissions. This inequality would be removed more quickly, not by continuing the present *laissez-faire* policy, but by adopting positive measures to promote equalization of opportunities, such as the grant of scholarships on the 'school cluster' basis recommended elsewhere.[2] When such measures are provided on an adequate scale and it is clearly demonstrated that they increase the proportional enrolment of the backward or under-privileged groups in institutions of higher education, opposition to selective admissions will quickly diminish and even disappear. As a transitional measure, however, these fears may be allayed, if necessary, by adopting a suitable system of reservation of seats.

5.29. It is often argued that secondary and higher education should be given to all young persons who have completed primary and secondary education and cannot find jobs and it is further contended that such asylum for them is a lesser evil than leaving them on the streets. this is an escapist attitude, commonly observed in developing and labour-surplus societies, to over-educate young persons by regarding education as a substitute rather than as a preparation for work. In industrialized and labour-deficit societies, job opportunities are so plentiful that many young persons remain in school largely because of compulsory laws. As soon as the compulsory age-limit is reached, a large proportion (varying from 30 to 75 per cent) leave school and take up employment. This helps also in improving standards in educational institutions, because resources are plentiful in relation to the number of places to be provided in post-compulsory education. In developing and labour-surplus economies, on the other hand, employment opportunities are so poor that 'opportunity costs' of education are very low and young people join secondary schools or colleges either because there is nothing else to do, or in the pious hope that a job may be more readily available from the raised platform of a higher education. But as resources are limited and the number of seats to be provided is larger, standards in secondary and higher education remain poor. The result, in some cases, is a negative rather than a positive contribution to individual and social life. We trust that decisive efforts will be made to withstand this tendency to use education as a substitute for employement.

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[1] The details about its organization are discussed in Chapter X.

[2] Chapter VI.

5.30. Much of the opposition to a policy of selective admissions would disappear if good methods of selection were evolved. Existing methods of selection tend to be based on a rather rigid acceptance of examination marks. This approach finds popular support because of its apparent 'justice', facility of administration, and because of a fear that any discretion given to individual institutions may lead to favouritism, nepotism, casteism or even corruption. But examination marks are an undependable measure of native talent or of potential growth. They are also socially unjust, being heavily weighted in favour of urban students and children from well-to-do homes and good schools. What is needed is a reliable method of selection which will take account of past performances, native talent and the principles of social justice. Educational research will have to be developed vigorously to discover such methods. Suggestions for reform of present methods are discussed later.[1]

5.31. If enrolment in higher secondary and university education should be related to broadly determined national goals for trained manpower, two steps are needed. The first is to fix the number of places in university departments or colleges in advance, keeping in view the manpower needs and the facilities available; and the second is to make admissions to these places on a selective basis with due regard to the natural talents of the students, their achievements at earlier stages, and the principles of social justice. A policy of selective admissions is already being implemented, to a large extent, in courses in science, technology, medicine and agriculture and even in a fair number of institutions of general education which are anxious to maintain standards. The techniques of selection now in force will have to be improved on the lines indicated above. Moreover, it has now become urgent to ensure that the principle of selective admissions becomes the national policy for all courses and institutions of higher education, including courses in humanities and commerce and in the affiliated colleges.

5.32. **Development of Vocational Education.** Estimates of manpower needs also serve as a guide for the expansion of vocational education. We shall discuss specific vocational training, in engineering and agriculture, elsewhere.[2] For the present we are concerned with the overall balance between general and vocational education at the secondary and higher levels.

5.33. At the lower secondary level, leading to matriculation, we must realize that the manpower data available give little guidance on the extent of vacationalization. Manpower needs are expressed in terms of matriculates only or in terms of pupils successfully completing courses of general education. Pupils in schools for technical or industrial education, arts and crafts training, or for music, dancing and other fine arts are not represented in the manpower data. How far these courses should expand and what new courses of a vocational or practical nature should be started are questions which can be answered only after further study. Our proposals on this subject will be discussed in the chapter on School Education.[3]

5.34. At the higher secondary level, leading to intermediate or its equivalent, considerable guidance is given by the manpower forecasts. These suggest that by 1985-86 there should be 2,413,000 enrolments in vocational schools and perhaps 600,000 in vocational colleges out of total enrolments of 6,873,000. This is equivalent to 43 per cent of the total. Our proposals on this subject are discussed elsewhere.[1] We are of the view that vocational education at this level has to be emphasized. We have, therefore, assumed that enrolments in vocational courses at this level would be about 50 per cent of the total.

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[1] Chapter XII.

[2] Chapters XIV and XV.

[3] Chapter VII.

5.35. At the undergraduate level, forecasts of the need for specialists suggest some 833,000 enrolments in 1985-86, in engineering, agriculture and medicine. To this must be added the enrolments in degree courses in teaching and law. Our proposals on this subject are discussed elsewhere.[2]

5.36. As stated earlier, the total enrolments needed as well as the percentages of enrolments in different sectors which are derived from manpower data are not highly precise. The central principle on which they have been calculated, *i.e.*, the Tinbergen formula, is itself open to question on several counts. The calculations are further complicated by the difficulties inherent in the available statistical data. But all things considered, we believe that they do offer a broad guide to the orders of magnitude involved and for the formulation of a national enrolment policy. But, as stated earlier, these will have to be continuously revised in the light of the experience gained, improved techniques discovered and availability of more refined data.

5.37. Three other points deserve notice. The first refers to financial feasibility. Forecasts of manpower needs on these lines give only a broad quantitative indication of the needed workers according to broad levels of educational attainment. But the education and training of the number of workers indicated at given levels of efficiency may require expenditure of an order which the economy will not be able to afford. It is, therefore, necessary to examine the financial implications of the manpower needs continuously. The maintenance of proper standards should always be ensured. But where the total cost of the proposals goes beyond the finances available, priorities will have to be determined and enforced.

5.38. The second is the availability of real resources to train the manpower needed. In a poor country, money is difficult to be raised, no doubt. But it is easier to raise money than to find the necessary real resources, *i.e.*, teachers, equipment and buildings. It is much easier to create a post than to find a suitable person to hold it. In spite of funds being available, for instance, the shortage of staff in engineering institutions is of the order of 30 per cent or more. Equipment, particularly of foreign manufacture, is in short supply; and grants for buildings remain often unutilized because steel and cement are not available. It is therefore necessary to examine the forecasts of manpower needs continuously and to plan only that level of expansion which would be feasible in terms of real resources available. While every effort should be made to increase the allocation of real resources to education, it will be dangerous to expand facilities, in the absence of real resources, by diluting standards. In a situation of this type, hard choices about priorities will have to be made.

5.39. The third issue relates to utilization and the problem is similar to that of utilization of facilities which we discussed in Chapter II. When we think of increasing trained manpower, we should also think of the manner in which the existing trained manpower is being utilized. There is reason to believe that a fair proportion of our trained manpower is being under-utilized; and in some cases, it even remains unutilized. A continuous effort to study the problem is needed. To the extent we increase the utilization of existing trained manpower, there will be an immediate gain without further investment. It will also alter the forecasts for the future, either by reducing the numbers needed or by increasing the level of achievements.

5.40. **Enrolments and Manpower.** Table 5.5 shows the enrolment and manpower positions in 1961 and 1986.

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[1] Chapter VII.

[2] Chapters XII, XIV and XV.

TABLE 5.5. ENROLMENTS IN EDUCATION (1960—85)

(Thousands)

	1960-61			1975-76			1985-86		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Pre-Primary	5,381 (27·5)	3,231 (17·0)	8,612 (22·3)	5,000 (18·9)	5,000 (20·1)	10,000 (19·5)	5,000 (20·5)	5,000 (22·1)	10,000 (21·3)
Primary									
Classes I—IV	17,170 (74·0)	7,826 (35·0)	24,996 (54·8)	38,066 (109·7)	33,484 (68·6)	71,550 (89·7)	39,509 (110·0)	36,730 (110·0)	76,239 (110·0)
Classes V—VII	5,587 (35·5)	1,876 (12·5)	7,463 (24·3)	19,774 (81·9)	12,620 (55·7)	32,394 (69·2)	25,214 (90·0)	23,500 (90·0)	48,714 (90·0)
TOTAL	22,757	9,702	32,459	57,840	46,104	103,944	64,723	60,230	124,953
Secondary									
Classes VIII-X (General)	2,876 (19·9)	706 (5·2)	3,582 (12·8)	8,558 (38·3)	3,309 (15·6)	11,867 (27·3)	13,221 (48·3)	6,274 (24·5)	19,495 (36·8)
Classes VIII-X (Vocational)	65 (0·5)	35 (0·3)	100 (0·4)	546 (2·4)	272 (1·3)	818 (1·9)	3,305 (12·1)	1,568 (6·1)	4,873 (9·2)
Classes XI-XII (General)	418 (4·7)	73 (0·9)	491 (2·8)	1,262 (9·1)	354 (2·7)	1,616 (5·9)	2,502 (14·4)	935 (5·7)	3,437 (10·2)
Classes XI-XII (Vocational)	299 (3·3)	59 (0·7)	358 (2·1)	1,089 (7·9)	284 (2·1)	1,373 (5·1)	2,502 (14·4)	934 (5·7)	3,436 (10·2)
TOTAL	3,658	873	4,531	11,455	4,219	15,674	21,530	9,711	31,241
Higher									
Undergraduate (Arts, Science & Commerce)	351 (2·8)	83 (0·7)	434 (1·8)	1,038 (5·5)	312 (1·7)	1,350 (3·6)	1,589 (6·4)	563 (2·4)	2,152 (4·5)
Undergraduate (Professional)	131 (1·0)	15 (0·1)	147 (0·6)	432 (2·3)	99 (0·5)	531 (1·4)	818 (3·3)	230 (1·0)	1,048 (2·2)
Postgraduate (General and Professional)	53 (0·5)	11 (0·1)	64 (0·3)	257 (1·5)	64 (0·4)	321 (1·0)	749 (3·2)	211 (1·0)	960 (2·1)
TOTAL	535	109	645	1,727	475	2,202	3,156	1,004	4,160
GRAND TOTAL	32,331	13,915	46,247	76,022	55,798	131,820	94,409	75,945	170,354

N.B. The figures in parentheses represent percentages of the corresponding age-groups. Totals do not tally on account of rounding.

Source. Form A, Ministry of Education, for 1960-61. Figures for 1975-76 and 1985-86 have been estimated in the Secretariat of the Education Commission.

Notes :

(i) The statistics for 1960-61 are of actuals as reported by the Ministry of Education in Form A. These are, in some cases, different from those given earlier in Table 5.4 due to different bases adopted for tabulation. For the method followed by the Education Commission, see Note on Enrolment at the end of the Report.

(ii) The enrolments at the primary stage have been based on the need to fulfil the Constitutional Directive. They have no manpower implications. For details, see Chapter VII.

(iii) The enrolments at the lower secondary stage have been based on manpower estimates with one difference from the ISI/LSE paper: we have assumed the responsibility in vocational education to be 20 per cent of the total enrolment. (There are no manpower indications for this).

(iv) At the higher secondary stage, the total enrolment is based on manpower estimates. The enrolment in vocational education is assumed to be 50 per cent of the total enrolment, as against 43 per cent indicated by the ISI/LSE paper.

(v) At the undergraduate stage, the total enrolments as well as those in vocational education have been based on the manpower requirements given in the ISI/LSE paper.

(iv) The enrolments at the postgraduate stage have been derived separately. For details, see Chapter XIII. The ISI/LSE paper gives no forecasts for this stage of education.

It will be seen that the total enrolments in education will be about quadrupled between 1960-61 and 1985-86 and increase from 46 million to 170 million. The enrolment of boys will increase to about three times from 32 million to 94 million and that of girls to about five and a half times—from 14 million to 76 million.

5.41. **Educational Levels of the Working Force (1961—1986).** The educational levels of the total working force during the same period (1961—1986) are given in Tables 5.6 A and B.

TABLE 5·6 (A). ESTIMATED TOTAL FUTURE EMPLOYMENT IN INDIA (1961—1986)

(Thousands)

Industry	All workers 1960-61	Workers age 15 and above 1960-61	Workers age 15 and above 1975-76	Workers age 15 and above 1985-86
(1)	(2)	(3)	(4)	(5)
1. Agriculture	135,444	123,817	144,462	144,462
2. Mining and manufacturing	20,927	19,202	40,696	63,861
3. Construction	2,059	1,992	6,653	9,273
4. Trade and commerce	7,654	7,500	12,135	18,764
5. Transport and communication	3,019	2,995	6,882	11,525
6. Services (Others)	19,572	18,697	32,906	45,210
TOTAL . . .	188,675	174,203	243,734	293,095

Source. ISI/LSE Paper, Table No. 13.

TABLE 5·6 (B). MATRICULATES AND ABOVE AS PERCENTAGE OF TOTAL ESTIMATED EMPLOYMENT (1960-61 to 1985-86)

(Percentages)

	1960-61			1975-76			1985-86		
	Matriculate	Intermediate	Graduate	Matriculate	Intermediate	Graduate	Matriculate	Intermediate	Graduate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1. Agriculture . .	0·3	..	0·1	0·5	0·1	0·1	0·7	0·1	0·1
2. Mining and manufacturing .	2·4	0·5	0·5	7·8	1·5	1·8	11·5	2·2	2·7
3. Construction . .	4·8	1·5	0·9	7·6	2·3	1·5	12·2	3·6	2·3
4. Trade and commerce . .	5·9	1·3	1·2	9·7	2·2	2·0	13·7	3·0	2·8
5. Transport and communication	10·5	2·7	3·1	17·4	4·4	5·1	22·6	5·7	6·7
6. Services (Others) . .	7·7	2·1	3·9	12·6	3·2	5·3	14·8	3·7	7·0
TOTAL . . .	1·7	0·4	0·6	4·5	1·0	1.4	7·3	1·6	2·2

Source. ISI/LSE Paper, Table No. 14.

It will be seen from Tables 5.6 A and B, that, in spite of all the expansion of education we visualize, the proportion of educated and trained manpower would still be small even in 1986. We hope that illiteracy would be liquidated by then; or at any rate, there would be no illiterate workers. The proportion of matriculates in the total working force will increase from 1·7 per cent in 1960-61 to 4·5 per cent in 1975-76 and still further to 7·3 per cent by 1985-86. During the same period, the proportion of intermediates in the working force will rise from 0·4 per cent to 1.6 per cent and that of graduates from 0·6 per cent to 2·2 per cent. The total of all educated workers (matriculates and above) will rise from 2.7 per cent in 1960-61 to just over 11 per cent by 1985-86. This has also been graphically represented in chart on page 103.

5.42. It may be pointed out that even this projected achievement is much below the level already reached in industrialized countries. For instance, the educational level of the populations of the USA and Japan is as shown in Table 5.7.

TABLE 5·7. EDUCATIONAL LEVEL OF WORKING POPULATION IN JAPAN AND USA

Japan		USA	
Composition of Population (age 15 and over)		Composition of civilian labour force (age 18-64) as on March 1959	
Completed	*Per cent*	*Completed*	*Per cent*
Elementary school (Class I—VI)	15·9	Elementary Less than 5 years	4·7
Junior high school (Classes VII—IX)	44·8	5 to 8 years	24·2
Senior high school (Classes X—XII)	24·7	High School 1 to 3 years	20·3
		4 years	31·7
University or Junior college	5·2	College 1 to 3 years	9.4
		4 years or more	9·7
Attending Schools	7·3		
Never Attended Schools	2·2		

Source. Population Census 1960.

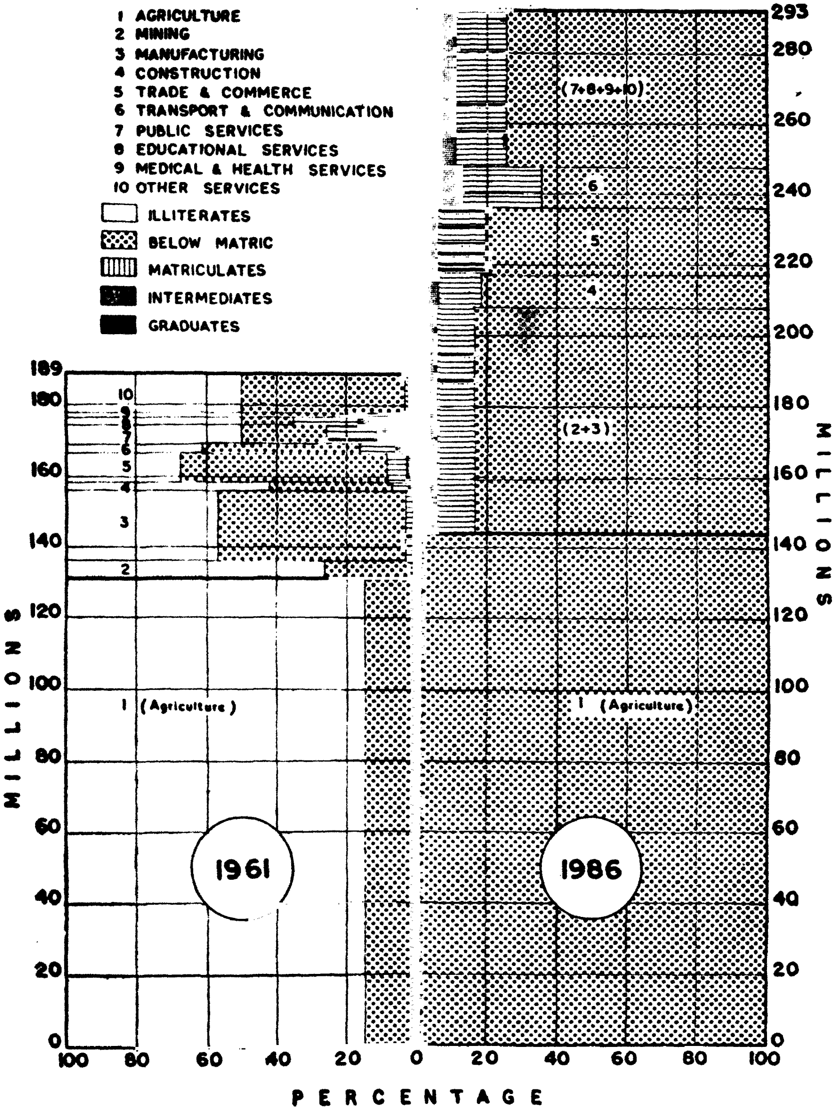
Source. Special Labour Force Report, No. 53, Bureau of Labour Statistics, p. A-6.

Relating Manpower Estimates to Enrolments

5.43. This brings us to our last point, namely, the creation of a machinery which will not only prepare estimates of manpower needs but also relate them effectively to the output of the educational system.

5.44. **Proposals of Shri R. A. Gopalaswami.** We are grateful to our colleague, Shri R. A. Gopalaswami, for preparing for our use, a number of detailed studies relating to educational outputs, manpower needs and employment opportunities and for suggestions regarding the manner in which the estimates of manpower needs could be translated in terms of enrolment policies. We have carefully examined his proposals as well as other material placed before us. We are in full agreement with Shri Gopalaswami that

EDUCATIONAL LEVEL OF WORKING POPULATION (INDIA) 1961 & 1986



there is need to correlate the development of higher education broadly with manpower needs and we also agree with him in the statement of the following four objectives and implications of this policy.

First, the annual requirements of the country in respect of additions to the national stock of higher educated manpower should be assessed in advance with as much precision and firmness as may be found to be practicable. Arrangements should be made to secure that the assessed requirements are adequately met by the annual supply of higher educated manpower cohorts made available by all the higher educational institutions in the country.

Secondly, arrangements should be made to ensure that higher educated manpower cohorts will not remain unemployed or wastefully under-employed. Employment should be made available as nearly as may be in those capacities in which they are able to make the best use of the educational preparation given to them.

Thirdly, the courses of studies which are at present provided in higher educational institutions should be reviewed in the light of the changes which are occurring in the pattern of employment of higher educated manpower cohorts. The structure and content of these courses of studies, as well as admission requirements, should be reviewed and the entire system reformed so as to provide the best possible educational preparation for the different occupational groups of higher educated manpower.

Fourthly, there is need for developing a new type of 'promotional extension' courses of studies for secondary educated persons who are already in employment and are found suitable for promotion, so as to raise their educational level to parity with that of higher educated manpower. Special arrangements necessary for this purpose should be devised and developed.

5.45. Shri Gopalaswami placed before us a detailed note outlining his proposals regarding the manner in which higher education should be reformed with a view to achieving these objectives. We have reproduced this note at the end of the Report as his Minute of Supplementation. Our proposals for relating the output of universities and other institutions of higher education with manpower needs have been described in the sections that follow.

5.46. One specific proposal needs mention in this context. Some of our colleagues are of the view that pressure on higher education can be considerably reduced if the Central and State Government were to recruit the personnel for all their services, not at the end of the first degree as is done at present, but at the end of the higher secondary stage. They also opine that this would increase the efficiency of the services themselves. As the idea has been elaborated in Shri Gopalaswami's Note, we do not think it necessary to state the case in its support or its organizational details at greater length. On a careful consideration of the proposal, however, we feel that it involves major questions of policy which go beyond our scope. We shall, therefore, merely content ourselves by drawing the attention of the authorities concerned to these proposals.

5.47. **Machinery for Manpower Planning.** We shall now briefly outline our proposals regarding the manner in which manpower estimates can be prepared, revised from time to time, and related to the enrolments in educational institutions. For this purpose, it will be necessary to devise suitable machinery at both the national and State levels.

(1) At the *national* level the Planning Commission has the responsibility for preparing estimates of manpower requirements in all sectors of *national* development and for revising them continuously. It may also consider the desirability of setting up, for this purpose, a *Standing Committee for Manpower* consisting of the representatives of the Ministries of Defence, Education, Food & Agriculture, Health, Home, Labour & Employment, Railways, and others concerned with the training of large and easily identifiable categories of manpower. The UGC on behalf of the universities—the largest producers of highly educated manpower—and the Institute of Applied Manpower Research should also be represented. This Committee should work in close collaboration with authorities for manpower planning at the State level. Its main responsibility should be to prepare and revise, from time to time, manpower forecasts for the overall output of the educational system as well as for different categories of specialists. These should be published for general information and for the guidance of those called upon to make decisions regarding the provision of educational facilities. The Committee should also advise Ministries of the Government of India and the State Governments on manpower problems and their implications for educational planning.

(2) At the *State* level, it may be desirable to set up *State Committees on Manpower* on the broad lines of the Standing Committee for Manpower at the Centre and having similar functions and responsibilities. It would be a duty of the State Committees to prepare State-level plans for manpower development. Similar plans at the district level should also be prepared as soon as practicable. The universities in the State should be closely associated with this Committee.

When this machinery is in place, the best possible estimates of the requirements of manpower will be available at the national and State levels, and, where necessary and possible (*e.g.*, in respect of primary teachers), even at the district level.

5.48. **Relating Manpower Estimates to Output of Educational Institutions.** The next problem is to relate these estimates to the intake and output of the educational system or, to 'plan' the facilities to be provided in educational institutions in accordance with manpower requirements. This will have to be done both at the national and at the State levels.

(1) *National Level.* Planning at the *national level* should be done by the Centre in consultation with the States and should cover all sectors crucial for national development, where the mobility of trained personnel is or should be high, where it is very costly to set up institutions for training personnel or where the very high level staff required for such institutions is in short supply. These should include engineering, agricultural and medical education, and the preparation of teachers for higher education.

(2) *State Level.* The planning of the remaining sectors should be done at the *State level* by State Governments. The universities, which train all the higher level manpower and the district educational authorities who will be in charge of all education below the university level, should be closely associated with a programme to be developed on the following lines:

(a) The planning facilities in secondary and higher education (excluding the sectors for which planning would be done at the Central level) should be done at the State level.

(b) The provision of vocational education —both of school and college standard—will have to be expanded in all areas on a priority basis in keeping with the manpower needs. The same is also applicable to many areas of science education.

(c) For enrolments in general education, however, which is under-developed in some areas and over-developed in others, a policy of equalization will have to be adopted. Decisions will have to be made by each State in view of its conditions; but as a general basis, the following may be suggested:

(i) In all areas where the level of expansion reached is below the national average in 1966, steps should be taken to promote expansion.

(ii) In all areas where the level of expansion reached is about equal to the national average expected in [illegible]6, a restrictive policy should be adopted unless there are special reasons to the contrary.

(iii) It will be for the Government of India to suggest the targets to be reached, from time to time, at the State level. State Governments may, in their turn, indicate suitable targets at the district levels.

(iv) The planning of higher education should be done on a State-basis. All *universities in the State should* be involved in this. Each university should be required to prepare a five year plan of the facilities to be provided in all its teaching departments and affiliated colleges and the output therefrom, and these should be approved after bringing them into accord with manpower needs. In granting affiliations or expanding their departments, the universities should be required to follow these plans.

(v) It is also essential to have an authority at the district level which can plan all school education. This authority will have to plan in the light of general directives given from the Centre and the States. In order to assist it in its work, local studies of manpower needs, etc., will have to be carried out.

GENERAL

5.49. **Education and Employment.** In the present educational system there is no direct link between education and employment and no attempt is made even to establish an indirect link by relating the output of the educational system closely with manpower needs or job opportunities. The recommendations made above will establish this link indirectly. But we might consider whether it would be possible to establish a direct link between education and employment. Under a good arrangement, every graduate should be given, along with his degree or diploma, an offer of appointment as well. This offer need not be binding and it may be left open to the student, with the approval of the Government, to accept another offer. Moreover, the period of the offer may also be made brief—one to three years—so as to avoid any undue hardship. But a compulsion on the State to make such an offer would be the surest guarantee that the output of the educational system is closely linked with employment opportunities or manpower needs. It will also improve the motivation of the students, give a purpose to their education, and make them feel that the country needs them and is waiting for them. In our opinion, this change could be an important factor in raising standards in higher education and in reducing the problems of discipline to the minimum. We realize, however, that it may not be possible to do so in the present situation, when the output in some sectors far exceeds the possibilities of employment. But we should strive to move towards this goal over a period of years; and we should make at least a beginning in a few selected sectors where numbers are manageable. The system of one-year internship, which is now prescribed for medical graduates, is a good beginning in this direction, though there is a certain resentment against it at present on the ground that the medical profession is singled out for this compulsion. If the system were to become more widespread and made applicable to one category of graduates after another till all categories were covered, this resentment would disappear and the efficiency of the system would also improve.

5.50. **The Need for a Wider Perspective.** Significant problems of life cannot be solved in isolation. The planning of education is no exception to this general rule and, in our opinion, it may not be possible to find a satisfactory solution to it unless wider issues are solved. For instance, if manpower planning is to be successful in the sense that there would be a trained man available for every job to be done and that an appropriate job would be available for every educated person, it is necessary to prepare an integrated plan of development—a plan which will consist of three parts: family planning, economic development and educational reconstruction. At present, the labour force cohort (*i.e.* the boys and girls who attain the age of 16 or over and enter the labour force in a given year) suffers from several serious defects or difficulties such as the following:

—Its size is too large—about 2 per cent of the total population—owing to the large birth-rate.

—Its educational attainments are also very meagre—about 60 per cent of the cohort is illiterate and about 40 per cent would have completed primary schooling and attained permanent literacy. Of the latter 40 per cent about 25 per cent would have received more than five years of schooling and probably completed the primary school course; about 8 per cent would have completed the secondary school; and only about 1 or 2 per cent might be graduates. The proportion of the educated persons in these cohorts is far too inadequate for the creation of a modern social order. What is worse, the little education that has been given is so predominantly academic that there are no trained persons to man the key posts in certain sectors of industrialization now being developed.

—The rate of economic development, especially in rural areas, is so slow that there are not enough jobs for even half of this cohort.

5.51. If this situation is to be improved, it is necessary to prepare an integrated plan of development with these objects:

—to reduce the birth-rate to about half in a planned programme of 10-15 years;

—to bring about a very rapid economic development in such a manner that there would be a job for every young man or woman who enters the labour force; and

—to provide such education to the young boys and girls as will qualify them, by having a specific job to do, to participate effectively in the national development programme.

Such plans are needed at the national, State and even district levels. Their preparation and implementation is the responsibility of the Government—Central, State and Local. It is only in the wider perspective of such plans that the problem of educational planning can be successfully solved.

CHAPTER VI

TOWARDS EQUALIZATION OF EDUCATIONAL OPPORTUNITY

I. *Tuition Fees and Other Private Costs*: (8) Fees in education; (11) Fees at the primary stage; (12) Fees at the secondary stage; (14) Fees in higher education; (16) Other private costs.

II. *Scholarships*: (18) Basis of reorganization; (19) Scholarships at the primary stage; (20) Scholarships at the secondary stage; (24) Scholarships at the university stage; (25) Number of scholarships; (26) Amount of scholarships; (27) National scholarships; (28) University scholarships; (31) Scholarships in vocational education; (34) Scholarships for study abroad; (35) Loan scholarships; (39) Some general problems relating to student aid; (40) Financial responsibility for scholarships.

III. *Handicapped Children*: (43) Scope and size of the programme; (45) Existing educational facilities; (46) A plan for action.

IV. *Regional Imbalances*: (50) Imbalances in educational development in the States; (51) Imbalances in educational development in the districts.

V. *Education of Girls*: (54) Development of the education of girls (1950-51 to 1965-66); (55) Recommendations.

VI. *Education of Scheduled Tribes*: (59) The problem; (63) Present position; (64) Primary education; (66) Secondary education; (68) Higher education; (69) General.

6.01. One of the important social objectives of education is to equalize opportunity, enabling the backward or underprivileged classes and individuals to use education as a lever for the improvement of their condition. Every society that values social justice and is anxious to improve the lot of the common man and cultivate all available talent, must ensure progressive equality of opportunity to all sections of the population. This is the only guarantee for the building up of an egalitarian and human society in which the exploitation of the weak will be minimized.

6.02. Inequalities of educational opportunities arise in various ways. In places where no primary, secondary, or collegiate institutions exist, children do not have the same opportunity as those who have these facilities in the neighbourhood. This handicap should be overcome by the widest dispersal of educational institutions, consistent with economy and efficiency, by instituting an adequate scholarship programme, by providing the needed hostel facilities or by making suitable transport arrangements. It is sometimes not fully appreciated that there are at present glaring imbalances of educational development in different parts of the country: the educational developments in the States show wide differences, and even wider differences are found between the districts. To remove such inequalities, deliberate policies of equalization of educational opportunities and educational development in the different districts will have to be adopted.

6.03. Another cause of inequality of educational opportunity is the poverty of a large section of the population and the relative affluence of a small minority. Even in the neighbourhood of an educational institution, children from poor families do not have the same chance as those who come from richer ones. To overcome these handicaps, it is desirable to abolish fees progressively, to provide free books, stationery and even school meals and uniforms. In addition, it is necessary to develop a large programme of scholarships.

6.04. Again, differences in the standards of schools and colleges create an extremely intractable form of educational inequality. When admission to an institution such as a university or professional college, is made on the basis of marks obtained at the public examination at the end of the secondary stage, as often happens, the marks do not at all provide a common yardstick for a student from a rural area who attends an ill-equipped school in his village, and a student from an urban area who attends a good city school. To overcome this to some extent at least, it is necessary to evolve more reliable and egalitarian methods of selection, whether for admission to institutions or for award of scholarships.

6.05. Gross inequalities arise from differences in home environments. A child from a rural household or an urban slum having illiterate parents, does not have the same opportunity which a child from an upper class home with highly educated parents has. These inequalities are obviously the most difficult to overcome and here progress essentially depends on the general improvement in the standard of living of the population. But something can be done by arranging that special attention at school is paid to children from the under-privileged groups and by the provision of day-study centres or boarding houses.

6.06. Two other forms of educational inequalities, which are peculiar to the Indian situation, need attention. The first is the wide disparity between the education of boys and girls at all stages and in all sectors of education. The second is the equally wide, or sometimes wider disparity of educational development between the advanced classes and the backward ones—the Scheduled Castes and the Scheduled Tribes. On grounds of social justice as well as for the furtherance of democracy, it is essential to make special efforts to equalize educational opportunities between these groups.

6.07. Like all ideals in life, perfect equality of educational opportunity is probably unattainable. In such matters, however, the essence of the problem is not the attainment of the goal, but an impassioned faith and earnest striving. In a good system of education, there should be a continuous attempt to identify factors which tend to create significant forms of inequality and to adopt measures either to eliminate them altogether or at least to reduce them to the minimum.

We shall address ourselves, in the course of this chapter, to an examination of the implication of this policy for Indian education during the next twenty years.

TUITION FEES AND OTHER PRIVATE COSTS

6.08. **Fees in Education.**—The attitude towards tuition fees has undergone several changes in our modern educational history. In 1854, the Wood's Education Despatch, which laid the foundation for the present system of education, insisted that some fee, however small, should be charged in all institutions on two grounds: people do not value anything which is given free; and the payment of a fee is an indication of the seriousness of purpose on the part of a student or his guardian. This view soon gave way to a concept of fees as a source of revenue for supporting schools; and in 1946-47, fees accounted for 25.6 per cent of the total educational expenditure. Since then dependence on fees as a source of revenue is diminishing and Government is assuming an increasing burden in the financing of education. This will be seen from the statistics given in Table 6.1.

TABLE 6.1. TOTAL REVENUE FROM FEES

(1950-51 to 1965-66)

	1950-51	1955-56	1960-61	1965-66 (Estimated)
	Rs.	Rs.	Rs.	Rs.
1. Total receipts from fees (in 000's)	233,272	379,033	590,258	918,077
2. Index of growth	100	162	253	394
3. As percentage of total educational expenditure	20·4	20·0	17·1	15·3
4. Contribution from Government Funds as percentage of total educational expenditure	57·1	61·8	68·0	71·2
	First Plan	*Second Plan*	*Third Plan*	*All Plans*
5. Average annual rate of growth in fees	10·2	9·3	9·2	9·6

Source. Ministry of Education, Form A, except for 1965-66 which has been estimated in the Secretariat of the Commission.

6.09. The incidence of fees varies from stage to stage and from one type of educational institution to another. The percentage of students paying fees, the rates of fees, the type of institution charging fees and the total amount of fees collected—all show considerable variations. The detailed statistics relating to these matters for 1960-61—the latest year for which data are available—are given in Table 6.2.

TABLE 6.2. FEES IN EDUCATION

(1960-61)

Stage-Object	Total amount collected through fees (Rs. in 000's)	Percentage of students paying fees	Average annual fee collected per student (Rs.)	Percentage of fees to total expenditure on the stage	Percentage of fees collected at the stage to total of fees collected at all stages
1. Pre-Schools	2,184	77·5	23·3	37·2	0·4
2. Lower Primary Schools	17,169	3·9	16·4	2·3	2·9
3. Higher Primary Schools	31,677	16·4	18·2	7·4	5·4
4. Secondary Schools	270,394	64·8	55·6	39·2	45·8
5. Schools for Teacher Training	1,856	20·0	84·2	5·3	0·3
6. Schools for Vocational Education (excluding Teacher Training)	13,604	72·0	65·0	17·2	2·3
7. Schools for Special Education	1,378	10·0	8·1	4·3	0·2
8. University Teaching Departments	52,934	90·1	..	37·4	9·0
9. Research Institutions	375	86·3	147·1	1·4	0·1
10. Colleges for Arts & Science	101,384	84·9	172·7	48·5	17·2
11. Colleges for Teacher Training	2,761	34·7	156·9	12·8	0·5
12. Colleges for Professional Education (excluding Teacher Training)	30,346	87·9	240·5	22·2	5·1
13. Colleges for Special Education	1,447	52·4	109·0	15·9	0·2
ALL INSTITUTIONS	527,510	18·7	..	20·7	89·4
14. Boards of Education	23,342	..	..	96·7	3·9
15. Indirect Expenditure	39,406	..	..	1·7	6·7
GRAND TOTAL	590,258	..	..	17·1	100·0

Source. Ministry of Education, Form A.

It will be seen that pre-primary education is mostly supported by fees.[1] Fees have almost disappeared at the lower primary stage; but they do play a more significant role at the higher primary stage. Their contribution becomes very important at the secondary stage where the fees collected form 45.8 per cent of all fees collected in the educational system, and where they contribute 39.2 per cent of the total expenditure on secondary schools.[2] The position in vocational schools, universities, colleges of arts and science, and colleges of professional education is broadly similar; the proportion of free-studentships is comparatively small; the fee collected per student is comparatively high; and the revenue from fees contributes a sizeable amount towards the expenditure of the institutions concerned.

6.10. It is undesirable to regard fees as a source of revenue. They are the most regressive form of taxation, fall more heavily on the poorer classes of society and act as an anti-egalitarian force. Suggestions have been made to make them progressive by relating them, on a graduated scale, to the income of the parent and the size of the family. But this would not be administratively feasible and, in a country where sixty per cent of the population has an income of less than Rs. 20 per head per month, their yield would be almost negligible. It would, on the whole, be much better to raise the required revenue in some other and more equitable form than to depend on fees. We recommend, therefore, that the country should gradually work towards a stage when all education would be tuition-free. The implementation of this programme, however, would have to be spread over a period of time and the abolition of tuition fees will have to proceed from stage to stage, beginning with primary. It may be mentioned that school education is completely free in most countries, and all education from elementary school to the research degree is free in the USSR.

6.11. **Fees at the Primary Stage.** The Constitution requires the provision of free and compulsory education for all children up to the age of 14 years. Even though the 'compulsory' part of this directive may take about 20 years for realization, the 'free' part of it should be implemented without delay. We, therefore, recommend that all tuition fees at the primary stage should be abolished as early as possible and preferably before the end of the fourth five year plan. This implies that there would be no tuition fees in government, local authority and aided private schools, grants-in-aid to the last group being suitably adjusted. Fee-charging independent private schools which receive no aid may, however, continue to exist.[3]

6.12. **Fees at the Secondary Stage.** At the secondary stage, the problem is a little more difficult. Two arguments have been put forward in favour of the levy of fees at this stage. The first is that the expansion of secondary education being still largely restricted to the middle and upper classes of the society, the abolition of fees will be more in favour of the haves than of the have-nots, and the second is that the revenue from fees collected at this stage being substantial, the abolition of fees would be neither feasible nor desirable from the financial point of view. We cannot agree with either of these arguments. The levy of fees in secondary schools prevents several children from the poorer classes of society, and particularly girls, from receiving education and it is mostly among these groups that the expansion of secondary education will have to take place in the next two decades. The abolition of fees at the secondary stage is thus intended mainly for the benefit of such under-privileged groups who are now entering secondary education in large numbers. It is also necessary to point out that the total revenue from fees collected at the secondary stage has declined considerably in the third five year plan. Madras has made all education free till the end of the secondary stage. Uttar Pradesh and Orissa have made it free for girls. Mysore, which had already introduced a very large programme of free-studentships, has now decided to follow Madras from the current year. We understand that Andhra Pradesh is also proposing to adopt the same policy. Maharashtra and Gujarat now provide free-studentships to nearly 85 per cent of the total enrolment. In Punjab, Madhya Pradesh and Rajasthan, it is free for girls in all government schools at least and very largely free for boys also. In all parts of the country, it has always been free for the

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[1] Except in the rural balwadis whose statistics are not included here and which are all tuition-free.

[2] In 1960-61 the provision for free-studentships was rather meagre at this stage, although the position has considerably changed since.

[3] For details see Chapter X.

Scheduled Castes, the Scheduled Tribes and some other backward classes. If all these developments are duly allowed for, it appears that the provision of tuition-free secondary education is limited only in Assam, Bihar, Orissa (for boys), Uttar Pradesh (for boys) and West Bengal. The difficulty of making secondary education free of tuition or of finding alternative sources for the loss of revenue involved is thus no longer as formidable as it was five years ago.

6.13. There was a view in the Commission that the levy of tuition fees must continue to be the rule for lower secondary education, tempered by adequate and suitable provision for the grant of concessions and exemptions to all the needy students. On a careful consideration of the problem, however, we think that such a system does not have much to commend itself and involves several administrative difficulties. We, therefore, recommend that lower secondary education should be made tuition-free in all government, local authority and aided private institutions as early as possible and, preferably before the end of the fifth plan. Even where it is not possible to implement this recommendation in one step, a beginning should be made by making all vocational secondary education free; and as resources permit, the principle should be extended to girls and to children who come from the poorer families. Fees in higher secondary education should, however, be dealt with on the same lines as in university education, our proposals regarding which are given in paragraphs 6.14 and 6.15.

6.14. **Fees in Higher Education.** At present, fees play an important role in higher education. Table 6.1 will show that in 1960-61 fees contributed 37.4 per cent of the total expenditure on universities, 48·5 per cent of that on colleges of general education, 22.2 per cent of that in colleges of professional education (excluding teacher training), 15.9 per cent in colleges for special education and 12.8 per cent in colleges of teacher training. For higher education as a whole, the contribution of fees was as high as 37·3 per cent of the total expenditure. This is even larger than that in the educationally advanced and richer countries. In the United States, for instance, only about 25 per cent of the income of institutions of higher learning is derived from fees and in Britain, it is less than one-eighth.

6.15. We do not advocate the immediate general abolition of fees in higher education, although this should be the ultimate goal of educational policy. This programme has a lower priority than that of making all school education free and should be considered only after tuition fees have been abolished in secondary schools. At present, when higher education is mostly being availed of by the top five per cent of the population, a policy of levying fees combined with that of liberal provision of free-studentships to all the needy and deserving students would prove to be better than that of general abolition of fees. We, therefore, recommend that, for the next ten years, the main effort with regard to fees in higher secondary and university education should be to expand the provision of tuition-free education to cover all the needy and deserving students. To begin with, the proportion of free-studentships should be increased to at least 30 per cent of the total enrolment.[1] We also commend, for general acceptance, policies which have been adopted in some areas to provide tuition-free higher education to under-privileged groups, *e.g.*, provision of free-studentships to Scheduled Castes, Scheduled Tribes, girls, or children of persons whose income is below a prescribed level. This will be adequate to meet the social demand from the under-privileged sections of society that are now in secondary schools and are quickly moving up to seek admission to institutions of higher education. The problem may be reviewed again after ten years.

6.16. **Other Private Costs.** The private costs of education required for textbooks, supplies, co-curricular activities, etc., have increased very substantially in recent years and amount, not infrequently, to several times the tuition fees. In fact, the greater financial burden that creates the non-egalitarian trends today is not so much tuition-fees as these other costs. The Commission carried out a small study to discover the approximate level of these indirect costs at the school stage. For this purpose, we selected a few schools with varying levels of such costs in each State and Union Territory and collected detailed information from them. The results are summarized in Table 6.3

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[1] At present, the proportion of free-studentships to total enrolment in institutions of higher education is very small—14.6 per cent of students get tuition-free education in universities, 15·1 per cent in colleges of general education, 12·1 per cent in colleges of professional education, and 47·6 per cent in colleges of special education (1960-61 figures).

TABLE 6.3. PRIVATE COSTS OF EDUCATION (ANNUAL) 1965-66

Rupees

Class	Total private costs of education					
	Lowest			Highest		
	Text-books	Stationery	Total	Text-books	Stationery	Total
I	0·50	0·60	1·10	17·80	12·80	30·60
II	0·54	0·60	1·14	16·60	12·80	29·40
III	0·69	2·11	2·80	28·51	8·33	36·84
IV	2·10	3·26	5·36	38·85	14·50	53·35
V	3·91	2·40	6·31	36·10	14·50	50·60
VI	5·85	4·63	10·48	43·24	60·00	103·24
VII	7·29	4·88	12·17	47·09	75·00	112·09
VIII	9·30	6·95	16·25	169·68	21·40	191·08
IX	11·15	7·51	18·66	192·55	70·00	262·55
X	4·50	14·00	18·50	216·35	70·00	286·35
XI	13·75	11·25	25·00	189·65	70·00	259·65

Source. Data supplied by schools. For details of the study, see paper on the subject in Supplementary Volume I, Part V.

6.17. It will be seen from the above that parents are required to incur very heavy expenditure for this purpose. Consequently, only a small proportion of children have all the books at the beginning of the school year; a much larger proportion have them, not at the beginning of the school year, but towards the middle or even the end. Not infrequently, a proportion of students have no books at all. This has a very adverse effect on standards. We, therefore, recommend that an earnest effort be made to reduce these private costs of education. They are often raised thoughtlessly or for snobbish rather than for educational reasons. Side by side, a programme should immediately be developed for providing at least textbooks, if not stationery also, free of charge (or at concessional rates) to all students (or at least to all the needy and deserving students). This would be a crucial programme for the qualitative improvement of education. Obviously, the manner of its implementation will have to vary from one stage of education to another.

(1) *Primary Stage.* At the primary stage, a programme of providing free textbooks should be given very high priority and introduced immediately. It should also be extended to the higher primary stage as early as possible. Children freshly joining schools should be welcomed at a school function and presented with a set of books. Others should be presented with a complete set of books for the succeeding year as soon as the results of the annual examinations are declared and before the long vacation starts, so that they can make some use of the vacations for further study.

(2) *Secondary and University Stages.* A programme of book-banks[1] should be developed in secondary schools and in institutions of higher education. In addition, the libraries of these institutions should contain a large number of sets of textbooks so that every student can have access to them in the library or the reading room. The State Education Departments should have a fund at their disposal from which they

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[1] For details, see special paper on the subject in Supplementary Volume I, Part V.

could encourage the establishment of book-banks in secondary schools; and a similar fund should be placed at the disposal of the UGC which could organize them in the universities and affiliated colleges. The programme should be developed on so large a scale that every needy student in a secondary school or institution of higher education will be provided with a set of all the textbooks needed at the beginning of the school year or have easy access to them in the library.

(3) *Grants for Purchase of Books.* Grants for the purchase of books should be made to the more talented of the students. We recommend that the top 10 per cent of the students in educational institutions (subject to a means test, if necessary) should be given small grants annually for the purchase of books, which need not necessarily be textbooks. The scheme should be begun in the universities and later extended to affiliated colleges and secondary schools.

SCHOLARSHIPS

6.18. **Basis of Reorganization.** The programme of scholarships has received considerable emphasis in recent years. The total expenditure on scholarships has increased from Rs. 34·5 million or 3 per cent of the total educational expenditure in 1950-51 to about Rs. 420 million or 7 per cent of the total educational expenditure in 1965-66. A careful study of the position, however, shows that an attempt will have to be made to reorient and expand the existing scholarship programmes on the following lines:

- The scholarship programme is a continuous process and has to be organized at all stages of education. At present there is a fairly well-organized programme in higher education and vocational courses, although even here, much expansion is needed. But as there is no adequate programme at the school stage, a good deal of talent is already eliminated by the time the threshold of university entrance is reached. The provision of scholarships in higher education does not, therefore, prove as helpful as it might otherwise have been.

— It has not been possible to evolve a good method of selecting awardees for scholarships. At present, most scholarships are awarded on the basis of marks obtained in some public examination; and as these tend to favour students from the well-to-do homes or good urban schools, scholarships do not really help potentially talented students whose preparation has remained inadequate for no fault of theirs. A more equitable and egalitarian basis for the award of scholarships has, therefore, to be evolved.

— If the best results are to be obtained, a scholarship programme should be accompanied by a placement programme whose objective is to ensure that the scholarship holders are placed in good institutions and a further complementary programme of ensuring that an adequate number of institutions which maintain fairly high standards is available at all stages.

— A careful watch will have to be kept at all points of transfer from one stage or sub-stage of education to another to ensure that all the abler students (at least the top 5-15 per cent of the enrolment, depending upon the stage of education) do continue their studies further.

— An adequate machinery to administer the programme would have to be created and the operation of the programme fully decentralized to avoid the procedural delays and other difficulties that are experienced. at present.

In the light of these broad principles we indicate below the manner in which scholarship programmes should be reorganized at the different stages of education.

6.19. **Scholarships at the Primary Stage.** Steps should be taken to ensure that, at the end of the lower primary stage (Class IV or V), no 'promising' child is prevented from continuing his studies further on account of non-availability of a school, or of socio-economic difficulties; and to this end, scholarship of an adequate amount will have to be provided to every child that may need it. In addition, it will be desirable to evolve a placement programme and to try to place the brighter children to the extent possible in the good schools that may be available at this stage. We have assumed that the target should be to provide scholarships for 2·5 per cent of the enrolment at the higher primary stage by 1975-76 and to 5 per cent of the same enrolment by 1985-86.

6.20. **Scholarships at the Secondary Stage.** The main object of the scholarship programmes to be developed at the secondary stage would be to ensure that, under any circumstances, the top 15 per cent of the children in the age-group do get transferred to secondary schools and that their further education is not prevented by poverty. In this context, we would like to make the following concrete suggestions:

(1) The present system of awarding scholarships on a centralized basis such as a district or a block, tends to be unfair to students who have attended the weaker schools and who, in consequence, show an inferior level of preparation for no fault of theirs. While this system should be continued and even expanded, we recommend that as a supplement to it, about 10 per cent of students in Class VII or VIII in each school should be assisted, to the extent necessary, to continue their studies further. Taking the system as a whole, the target should be to provide scholarships to 5 per cent of the enrolment by 1975-76 and to 10 per cent of the enrolment by 1985-86.

(2) The existing programme of scholarships would have to be considerably expanded to meet the demands of the situation. Wherever necessary, hostel facilities will also have to be provided.

(3) To begin with, one good secondary school (with adequate residential facilities) should be developed in each community development block and about 10 per cent of urban schools should also be similarly covered. Access to these schools should be mainly on the basis of talent; and an adequate placement programme should be developed at this stage—this does not exist at all at present—to help the gifted students and the scholarship-holders to get admission to these schools.

6.21. The responsibility for the development of this comprehensive programme should be squarely placed on the Education Departments which should work in collaboration with the universities. The secondary stage is the most crucial for discovery and development of talent, and unfortunately, it is precisely at this stage that the scholarship programme is now weak. Its development will, therefore, have to be accorded high priority.

6.22. We are aware of the great difficulties and lack of reliable criteria and techniques for identifying talent. We, therefore, recommend that steps should be taken immediately to devise suitable techniques for identifying talent at this stage. Each State should organize a testing service at the end of the primary stage (Class VII or VIII) and also at the end of the lower secondary stage (Class X) and make its assistance available to all the schools. The details of the organization of this service, under a new body called the State Evaluation Organization, has been discussed elsewhere.[1] If properly developed, this service could be of considerable help to students and institutions: they would obtain some useful information about their performance in relation to the district, State or even the national average level of attainment; and such information, apart from its utility to students and parents, would also be of great assistance to the Education Departments in the award of scholarships.

6.23. Two further points need mention. The first is that every educational institution should be assisted to develop a programme for identifying the brighter children attending it and for providing them with special enrichment programmes to suit their needs and to help in their growth. These programmes, the nature of which would vary from stage to stage and from one type of institution to another, would have to be carefully designed and teachers would have to be trained in putting them across. Secondly, in all these programmes, 'talent' should not be understood in the traditional sense only, but should cover a wide range of mathematical, verbal, artistic and experimental skills. Scholarships and encouragement should be available, on a basis of equality, to all talent at all stages of education.

6.24. **Scholarships at the University Stage.** The programme of scholarships in higher education is extremely important. The bulk of the existing programme is in this sector and a very large part of it is provided by the Government of India. In our opinion, a further development on the following lines is needed:

— increase in the number of scholarships and other forms of student aid and in the amount of scholarships;

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[1] Chapter X.

and to select the top 'few' students in each cluster for the award of scholarships, the actual number of students to be selected depending upon the funds available. The 'top' students in one group may not come up to the top students in other groups. But they represent good potential talent and would make good if special arrangements were made in the universities or colleges to which they are admitted, to give them some special attention and help them to make up for the shortcomings in their attainments.

The general policy should be to award fifty per cent of the scholarships on the basis of school clusters and the remaining fifty per cent, as at present, on the basis of the State as a unit.

We strongly recommend this new method of awarding scholarships, especially at a time when the provision of higher education will be made only on a selective basis. This egalitarian approach will secure social justice and net a much greater amount of talent than is done at present. With the expansion of secondary education to rural areas, the establishment of a large number of new secondary schools every year, and the entry of young persons from the unprivileged sections of the society into secondary and higher education, students will now begin to arrive at the threshold of higher education with widely varying levels of preparation which reflect, not so much the variation in native capacity, as in their socio-economic backgrounds and in the standards of the secondary schools which they attended. Unless due allowance is made for them, the stratification of Indian society will tend to increase rather than decrease.

6.28. **University Scholarships.** At present, the number of scholarships awarded by the universities is extremely small both at the undergraduate and at the post-graduate stages. This is not a happy position. We recommend that a scheme of university scholarships should be developed in the fourth plan itself and the funds required for it should be placed at the disposal of the UGC which should make them available to the universities (and which, in their turn, should make them available to colleges). The award of the scholarships should be made in accordance with the rules framed by the universities with the approval of the UGC; and the authority to select students for the award in accordance with the rules should be delegated to the heads of the institutions. The target to be reached should be to cover about 10 per cent of the enrolment at the undergraduate stage and 20 per cent of such enrolment at the post-graduate stage by 1976.

These scholarships should be in the Central sector and the grants-in-aid on account of them should be borne by the Government of India, through the UGC, on a permanent basis.

6.29. There is a large Central scheme of post-matriculation scholarships for the Scheduled Castes and Scheduled Tribes. This will be discussed in a later section.

6.30. At the postgraduate stage, it is necessary to secure better coordination between the different agencies which award scholarships *e.g.*, the University Grants Commission, the Indian Council for Agricultural Research, the Atomic Energy Commission, etc. This multiplicity is welcome because it augments the resources available for scholarships. But it often leads to anomalies in the conditions for the award of scholarship (*e.g.*, in matters like the amount of scholarships, qualifications needed, etc.). We think that the necessary coordination would be secured if a Standing Committee on Postgraduate and Research Scholarships is set up at the national level in the Ministry of Education consisting of the representatives of the Ministries concerned and other organizations that award scholarships in the universities for postgraduate and research work and a representative of the Inter-University Board. The Committee could meet about twice a year, review the programmes in operation and see that they are properly coordinated.

6.31. **Scholarships in Vocational Education.** At present there is much larger provision of scholarships in vocational schools and professional colleges than in schools and colleges of general education. But further improvements are needed on two lines: (a) a more egalitarian policy in admissions; and (b) a still further increase in the number of scholarships as well as in their amount.

6.32. **Admissions.** The Commission carried out a study[1] of the socio-economic backgrounds of the students who generally go to vocational schools and their implications for policies relating to admissions and scholarships. At present, most of these institutions make their own admissions and award scholarships according to rules framed for the purpose. The pressure for admissions to institutions like the engineering and medical colleges has, however, led to the creation of centralized agencies for selection and placement of students. The Indian Institutes of Technology, which draw their students practically from all parts of the country, hold a common competitive examination for admission on a national basis. But as examination marks figure largely as a basis of selection, in most cases, the students admitted to the more important of these institutions generally tend to come from urban areas from good schools or from well-to-do homes. This will be seen from Table 6·4.

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[1] For details, see Supplementary Volume I, Part I, paper on *Socio-Economic Backgrounds of Students in Professional, Technical and Vocational Institutions.*

TABLE 6.4. SOCIO-ECONOMIC CONDITIONS OF STUDENTS ADMITTED TO VOCATIONAL, TECHNICAL AND PROFESSIONAL INSTITUTIONS IN 1965

	Institutes of Technology	Regional Engg. colleges	Engg. colleges	Medical colleges	Agricultural colleges	Polytechnics	I.T.Is.	Other Techanical Institutions	Total
I. *No. of Institutions Covered by the Study*	5	7	48	45	11	172	28	25	341
Students from									
Rural Areas	12·8	41·2	34·1	31·8	59·0	44·4	58·8	31·7	42·0
Urban Areas	87·2	58·8	65·9	68·2	41·0	55·6	41·2	68·3	58·0
II. *Occupation of Parents*									
Professional	7·2	10·9	8·7	17·1	4·9	7·7	4·2	11·3	8·3
Service	61·2	37·3	34·6	32·9	27·4	32·0	18·6	38·6	32·5
Business	20·1	17·7	21·2	17·9	7·0	19·1	12·5	22·4	18·5
Agriculturist	4·3	23·9	22·4	21·4	58·3	28·6	43·1	16·0	27·9
Others	7·2	10·2	13·1	10·7	2·4	12.6	21·6	11·7	12·8
III. *Income of Parents*									
Less than Rs. 150/- p.m.	6·9	32·9	38·7	30·8	58·7	55·8	83·0	27·9	50·5
Between Rs. 151-300	13·8	25·6	29·1	23·5	26·8	25·4	15·3	37·7	25·2
Between Rs. 301-500	20·6	23·8	19·6	19·6	10·7	11·8	1·5	20·8	13·7
Over Rs. 500/-	58·7	17·7	12·6	26·1	3·8	7·0	0·2	13·6	10·6
TOTAL NO OF STUDENTS	2,574 (100)	2,425 (100)	15,144 (100)	6,118 (100)	2,818 (100)	47,900 (100)	7,399 (100)	2,980 (100)	87,358 (100)

Source. Data supplied by the institutions.

The following broad conclusions can be drawn from the above data:

(1) *Institutes of Technology*. In the highest of these institutions—the Indian Institutes of Technology—87.2 per cent of the students come from urban areas and most of them also from well-to-do families (58·7% from those earning more than Rs. 500 per month).

(2) *Regional Engineering Colleges and Engineering Colleges*. In the regional engineering colleges, the under-privileged groups get a little more representation than in the Institutes of Technology. For instance, in comparison with the IITs, the proportion of rural students in regional colleges rises from 12·8 per cent to 41·2 per cent, that of agriculturists from 4·3 per cent to 23·9 per cent and that of persons with an income of less than Rs. 150 per month from 6·9 per cent to 32·9 per cent. The same trends are continued even further in the engineering colleges.

(3) *Medical Colleges*. Here also, the overall position is the same as that in engineering institutions; but in so far as admissions of the under-privileged groups are concerned, the medical colleges may be said to stand between the regional engineering colleges on the one hand and the engineering colleges on the other.

(4) *Agricultural Colleges.* Here the rural students are in a majority (59·0 per cent). Similarly, the agriculturists form **58·3** per cent and the children from the poorer families (with an income of less than Rs. 150 per month) are 58·7 per cent.

(5) *Polytechnics.* Here the rural areas, the agriculturists and the poorer families get much better representation than in other types of engineering institutions. It is to be particularly noted that children of parents whose income is in the lowest group (Rs. 150 per month) form as large a proportion as 55·8 per cent.

(6) *Industrial Training Institutions.* These are definitely the institutions of the poor man and of the rural community. The rural areas account for 58·8 per cent of their enrolment and the families in the lowest income bracket 83.0 per cent.

On the whole, the rural areas which form 80 per cent of the total population, get only 41.4 per cent of the seats in these institutions. Families with an income of less than Rs. 150 per month, who again form about 80 per cent of the total population, get 50.5 per cent of the total seats available.

6.33. With regard to the scholarships programme in vocational education, therefore, we make the following recommendations:

(1) It is necessary to make more intensive efforts in future to introduce an egalitarian element in admissions to institutions of vocational education and particularly to institutions like the institutes of technology and colleges of engineering and medicine.

(2) The admission examinations to the institutes of technology are held in English. This gives an undue weightage to students from English medium schools to which the rich send their children. We recommend that these admission examinations should be held in English and also in the regional languages and the best students from each linguistic group should be selected, if necessary, on the basis of a quota related to population. Some of the students so selected may not be quite up to the standard in English. But this deficiency should be overcome by giving an intensive training in English to the selected students in their first year at the institutes.

(3) The proportion of scholarships in institutions of vocational education should be much larger than in those of general education. At the school stage, about 30 per cent of the students should be covered by scholarships of one type or another; and at the collegiate stage, this proportion should be raised to 50 per cent.

6.34. **Scholarships for Study Abroad.** A national programme for award of scholarships to enable some of our best talented persons to go abroad for further education or training in research is also needed. Young persons so trained would be of very great use for the development of agriculture, industry, universities and research centres. We, therefore, recommend that a national programme of about 500 awards a year should be set up for this purpose

6.35. **Loan Scholarships.** An important issue raised in the evidence before us relates to the general use of loan scholarships. One view was that all scholarships in higher education should be given in the form of loans only. Three arguments were put forward in support of the proposal:

— it would set up a revolving fund in 5-10 years that would greatly reduce the burden on the State revenue;

— it would prevent wasteful expenditure as students would draw only the minimum amount required for their maintenance; and

— it would help to build up character and create a sense of responsibility and self-respect in the rising generation.

The counter-argument was that a programme of loan scholarships involves innumerable administrative problems about recoveries and causes hardship to young persons who would have to begin life with a heavy load of debt. To meet this, an elaborate proposal for the establishment of a National Scholarships Foundation to be set up by the Government of India under an Act of Parliament was advocated. This proposal visualizes that the Corporation would start functioning with a fairly big capital fund, say of Rs. 500 million or more. The interest to be charged on scholarships would be kept to the minimum, to cover only bad debts and administrative expenditure. The necessary loans would be advanced to young persons on their personal security only. Recovery would begin one year after the person begins to earn; and there would be no recovery if the earnings fall below a prescribed level. The instalments to be paid would be related to the total earnings of the person in a graduated manner. There would also be a suitable provision for bonuses or discounts for prompt payments; and to facilitate recovery, every employer would be under an obligation to deduct the loan-repayment instalments from the salary at source, on the analogy of the Income-Tax Act.

6.36. While we are attracted by several features of a scheme of this type, we are not in favour of restricting all scholarships in higher education to loans only. For the next ten years, the proposal of loan scholarships does not have any advantage over that of outright scholarships—the needed funds would have to be raised through taxation in either case. We also think that an exclusive programme of loan scholarships is non-egalitarian since it creates a disadvantage only for the economically handicapped students. It will also not be workable—unless a fair element of subsidy is provided—for students of humanities whose chances of employment and level of earning leave much to be desired. We would, therefore, prefer a proposal in which a programme of outright scholarships is combined with one of loan scholarships.

6.37. As we visualize it, the programme of loan scholarships in higher education should be organized on the following lines:

(1) The programme would be a supplement to that of outright scholarships which should be provided on the scale we have suggested.

(2) It would be essentially meant for students in the sciences and the professional courses where the chances of employment and levels of earnings are comparatively better and are more likely to make the scheme successful. There should be no upper limit to the number of such loan scholarships in this sector and an attempt should be made to provide financial assistance to every needy student. To a limited extent and in deserving cases, the programme should be extended to cover arts students also.

(3) If a person who holds a loan scholarship joins the teaching profession, one-tenth of the loan should be written off for each year of service. This will encourage good students to join this profession.

(4) For convenient administration of the loan scholarships programme, a National Loan Scholarships Board may be set up as outlined above.

6.38. The programme of scholarships and placement at the university stage will have to be accompanied by a complementary programme of developing quality institutions. This need will be met by the development of major universities, centres of advanced study, and of at least one good college in each district. The details of these programmes are discussed elsewhere.[1]

6.39. **Some General Problems relating to Student Aid.** We shall now briefly discuss a few other related issues. These relate to all stages of education.

(1) *Transport.* The provision of transport facilities can help to reduce the cost on hostels and scholarships. We have seen schools in rural areas which provide bicycles to the students who have to come from a distance. An arrangement of this type should be encouraged, as it makes the secondary school accessible to students in outlying villages. Wherever possible, the same arrangement could also be extended to other categories of institutions.

(2) *Day-Study Centres and Lodging Houses.* For students who do not have adequate facilities for study at home, it is necessary to provide a large number of day-study centres at the secondary and university stages. It would also be desirable to provide lodging houses *i.e.*, places where they can stay throughout the day, and even at night, but go home for food. Some institutions have tried to provide this facility by adopting an unorthodox approach *i.e.*, by using classrooms for residential and study purposes before and after school hours and at night. Experiments of this type should be encouraged.

(3) *Earn and Learn.* Facilities for students to earn and pay a part of their expenses should be developed on as large a scale as possible as a supplement to the programme of scholarships.

(4) *Scholarships for Girls.* In scholarships and other forms of student aid, preferential consideration should be given to the needs of girls.

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[1] Chapters XI—XIII.

6.40. **Financial Responsibility about Scholarships**. The data given in Table 6.5 for 1960-61 (the latest year for which they are available) show how the expenditure on scholarships at different stages and in different sectors of education were financed. The position in 1965-66 is expected to be similar.

TABLE 6.5. EXPENDITURE ON SCHOLARSHIPS/STIPENDS BY SOURCES (1960-61)

Type of institution	Percentage of expenditure incurred from the funds of				Total (in 000s.)	Percentage of expenditure on scholarships/stipends incurred on the type of institutions to total expenditure on scholarships/stipends from the funds of				
	Central Government	State Governments	Local Bodies	Other sources		Central Government	State Governments	Local Bodies	Other sources	Total
1. University Teaching Departments	41·3	38·2	..	20·5	5,871 (100)	7·7	2·5	0·3	12·5	4·5
2. Research Institutions	44·6	9·0	0·3	46·1	1,839 (100)	2·6	0·2	0·6	8·8	1·4
3. Colleges for General Education	44·2	48·2	0·3	7·3	27,248 (100)	38·4	14·9	6·6	20·8	21·0
4. Colleges for Professional Education	31·3	57·6	0·3	10·8	22,020 (100)	21·9	14·4	7·0	24·8	16·9
5. Colleges for Special Education	45·5	42·7	..	11·8	880 (100)	1·3	0·4	..	1·1	0·7
TOTAL HIGHER EDUCATION	39·0	49·4	0·3	11·3	57,858	71·9	32·4	14·5	68·0	44·5
6. Secondary Schools	12·2	81·0	0·8	6·0	26,337 (100)	10·2	24·2	21·8	16·4	20·3
7. Schools for Vocational Education	15·4	82·2	0·3	2·1	33,169 (100)	16·2	31·0	9·1	7·4	25·5
8. Higher Primary School	3·0	89·9	4·5	2·5	7,777 (100)	0·8	7·9	34·3	2·0	6·0
9. Lower Primary School	0·4	89·0	7·1	3·5	2,831 (100)	..	2·0	19·5	1·0	2.2
10. Pre-Primary School	..	100·0	..	..	1 (100)	..	..	..	..	..
11. Schools for Special Education	12·6	63·2	0·4	23·8	2,037 (100)	0·8	1·5	0·8	5·1	1·5
TOTAL SCHOOL EDUCATION	12·2	82·3	1·2	4·2	72,152 (100)	28·0	67·5	85·5	31·9	55·5
GRAND TOTAL	31,375 (24·1)	88,014 (67·7)	1,024 (0·8)	9,598 (7·4)	130,011 (100·0)	100·0	100·0	100·0	100·0	100·0

Source. Ministry of Education, Form A. (Totals do not tally because of rounding).

It will be seen that about 92 per cent of the expenditure on scholarships comes from Central and State Government funds. The Central funds account for nearly one-fourth of the total expenditure. More than seventy per cent of the Central expenditure on scholarships is incurred on higher education only.

6.41. Our recommendations in this regard are as follows:

(1) The responsibility for developing an adequate scholarship programme at the school stage should rest with the State Governments. In higher education, it should be regarded as a responsibility of the Government of India to make adequate provision for scholarships in all institutions of higher education—general and vocational—and also for scholarships for study abroad. We also trust that State Governments and other voluntary organizations which now provide some scholarships in higher education, would continue to do so and even expand their effort.

(2) To develop a good programme of scholarships at the school stage, the funds needed for it should be provided in the Centrally-sponsored sector in the fourth plan and the same basis may be continued in the fifth plan. The State Governments would then be able to carry it on on their own.

HANDICAPPED CHILDREN

6.42. We now turn to the education of handicapped children. Their education has to be organized not merely on humanitarian grounds, but also on grounds of utility. Proper education generally enables a handicapped child to overcome largely his (or her) handicap, and makes him into a useful citizen. Social justice also demands it: it has to be remembered that the Constitutional Directive on compulsory education includes handicapped children as well. Very little has been done in this field so far: and on account of several difficulties, any great improvement in the situation does not seem to be practicable in the near future. All the same, it is important that a serious beginning is made immediately. Our proposals attempt to indicate a feasible programme of action which may well lay the foundation for a more massive attack on the problem to be made in later years. There is much in the field that we could learn from the educationally advanced countries which in recent years have developed new methods and techniques, based on advances in science and medicine.

6.43. **Scope and Size of the Programme.** The primary task of education for a handicapped child is to prepare him for adjustment to a socio-cultural environment designed to meet the needs of the normal. It is essential, therefore, that the education of handicapped children should be an inseparable part of the general educational system. The differences lie in the methods employed to teach the child and the means the child uses to acquire information. These differences in methodology do not influence the content or the goals of education. This form of education is, therefore, conveniently referred to as 'special education'.

6.44. Determination of the size of the handicapped population has eluded educators, planners and social workers not only in this country but also in many of the economically advanced countries. For instance, even the United States does not have a reliable estimate of the number of handicapped children. From the available evidence, it appears, however, that the total population in the following categories is about 2·5 million in our country.

(1) *The Blind.* A recent survey undertaken under the auspices of the Ministry of Health has, however, suggested that the number of blind persons might be of the order of four million. This is also the estimate of the Royal Commonwealth Society for the Blind, London. The number of children of school age is estimated at 400,000.

(2) *The Deaf.* No national survey of the incidence of deafness has been undertaken. Estimates based on a few sample surveys would seem to indicate that the number of deaf persons in the country may be anywhere between 1 and 1.5 million. The number of children of school-going age is believed to be about 300,000.

(3) *The Orthopaedically Handicapped.* No national survey of this category of handicapped persons has yet been undertaken. Again, based on a few sample surveys, it would appear that the number of orthopaedically handicapped children in the country is about the same as that of the blind.

(4) *The Mentally Retarded.* Mental retardation is a complex concept influenced to a large extent by cultural factors and its determination involves the administration of sophisticated psychological tests. It is, therefore, difficult to estimate the number of such children in the country. Here again, estimates based on somewhat inadequate sample surveys seem to suggest that the country may have between 1.4 to 1.8 million mentally retarded children.

Briefly, the position is summed up below:

Category	Estimated number of children
The Blind	400,000
The Deaf	300,000
The Orthopaedically Handicapped . .	400,000
The Mentally Retarded	1,400,000
TOTAL . . .	2,500,000

6.45. **Existing Educational Facilities.** The present position of educational facilities for these children is as follows:

(1) *The Blind.* At present, there are about 115 schools and other establishments for the blind with an enrolment of 5,000 or a little over 1 per cent of the total number of blind children in the country. Most of these institutions impart primary education coupled with training in a few simple handicrafts. Music forms an integral part of the curriculum. The great majority of the existing institutions are run by voluntary agencies but are assisted by State Governments. The Central Government has set up a comprehensive National Centre for the Blind at Dehra Dun. This Centre includes a Central Braille Press which publishes textbooks and other reading material in Braille. The Centre also has a workshop for the manufacture of Braille appliances which produces the basic equipment needed for the education of the blind. There are three centres for the training of teachers of the blind sponsored by the Government of India and they can train between 30 and 40 teachers annually. In addition, the Governments of Madras and Andhra Pradesh conduct courses for training teachers when needed.

(2) *The Deaf.* The number of schools for deaf children is about 70. Most of these schools provide primary education coupled with some prevocational training in engineering and non-engineering occupations. The majority are privately managed but are aided by the State Governments. The total enrolment is about 4,000 or a little over one per cent of the total population of such children. About half a dozen centres for the training of teachers of the deaf are functioning at present and can train 50 to 60 teachers per annum.

(3) *The Orthopaedically Handicapped.* The major problem of this category of children is locomotor in character and they often attend ordinary schools. At present, there are about 25 institutions for such children with a total enrolment not exceeding about 1,000. Since most orthopaedically handicapped children do not present special educational problems, it is not considered necessary to have specially trained teachers for this category of children.

(4) *The Mentally Retarded.* On account of its complexity, this aspect of special education has received very little attention. There are only about 27 schools for mentally retarded children with a total enrolment not exceeding 2,000. One of these schools is run by the Government of India. Two centres for the training of teachers of mentally retarded children are functioning at present and they can train about 20 teachers annually.

At present, there are practically no facilities for the education of other categories of handicapped children. Some of the emotionally disturbed children are cared for in children's homes and other institutions set up under the various Children's Acts. As a rule, however, such homes are not intended primarily for the educational treatment of emotionally disturbed children.

It is evident from the brief review given in the preceding paragraphs that the existing facilities are extremely inadequate. In certain cases, the foundation has been laid while in others we have to begin at the beginning. The importance of a carefully thought-out plan for the development of educational services for the handicapped cannot, therefore, be over-emphasized.

6.46. **A Plan for Action.** The progress in providing educational facilities to handicapped children will be limited by two main considerations: teachers and financial resources. A reasonable target will, therefore, be to provide, by 1986, education for about 15 per cent of the blind, deaf and orthopaedically handicapped children and to about 5 per cent of the mentally retarded ones—this will mean the provision of educational facilities for about 10 per cent of the total number of handicapped children. As a part of the programme, it should be possible to have at least one good institution for the education of handicapped children in each district.

6.47. This goal can be reached through the adoption of two programmes—the special and the integrated. In the special programmes which alone have been developed so far in our country, the handicapped children are isolated from the normal ones and placed in special institutions. In the educationally advanced countries, however, a great deal of stress is now being laid on the integration of handicapped children into the regular school programmes. This has several advantages of which two are important: reduction of costs and promoting mutual understanding between handicapped and the non-handicapped children. This has also its disadvantages. For instance, many handicapped children find it psychologically disturbing to be placed in an ordinary school. On an overall view of the problem, however, we feel that experimentation with the integrated programmes is urgently required and every attempt should be made to bring in as many children into integrated programmes as possible.

6.48. In addition, it will be desirable to develop services on a pilot basis for some additional categories of children who have peculiar educational needs, *viz.*, the partially-sighted, the speech-handicapped, the aphasic, the brain injured and the emotionally disturbed. As pointed out earlier, hardly any attempts have been made in this field so far. It is impossible to state at this stage, what the number of such children will be. Even the facilities for training teachers are very inadequate. The Ministry of Health is already in the process of setting up an institute for the training of speech-therapists at Bangalore. These speech-therapists could deal with speech-handicapped and aphasic children. There are hardly any facilities for the training of teachers for the partially-sighted or the emotionally disturbed and brain-injured children. We, therefore, suggest that an attempt should be made in the next two plans, to set up a few centres as a pilot project, to assist these categories of children. The whole problem may be reviewed again after 10 years.

6.49. To develop these programmes adequately, attention will have to be paid to the following matters:

(1) The preparation of teachers will need emphasis and attention. Assuming a pupil-teacher ratio of 10:1, about 16,500 teachers will be needed for the blind, deaf and mentally retarded children only. This will necessitate a considerable increase in the capacity of the existing training institutions and the establishment of new ones.

(2) It is necessary to co-ordinate the efforts of different agencies working in the field such as the Ministry of Education, the Central Social Welfare Board, voluntary organizations interested in the problem and the Ministry of Health. Similar co-ordination will also be needed at the State levels.

(3) It is also necessary to develop adequate research in the problem. We recommend that the Ministry of Education should develop a programme for this and allocate the necessary funds. The NCERT should have a cell for the study of handicapped children. The principal function of this cell would be to keep in touch with the research that is being done in the country and outside and to prepare materials for the use of teachers.

REGIONAL IMBALANCES

6.50. **Imbalances of Educational Development in the States.** The development of educational facilities in the different parts of the country has been very uneven and one of the important objectives of educational policy should be to strive to reduce the existing imbalances to the minimum. With a view to highlighting the problem, we made a special study of some of the regional imbalances as they exist between the different States and districts for the year 1960-61, the latest year for which the data are available.[1] Table 6·6 shows some of the variations in the level of educational development in the States.

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[1] The detailed findings have been given in Supplementary Volume II, Part II.

TABLE 6·6. EDUCATIONAL ABILITY, EFFORT AND ACHIEVEMENT IN STATES (1960-61)

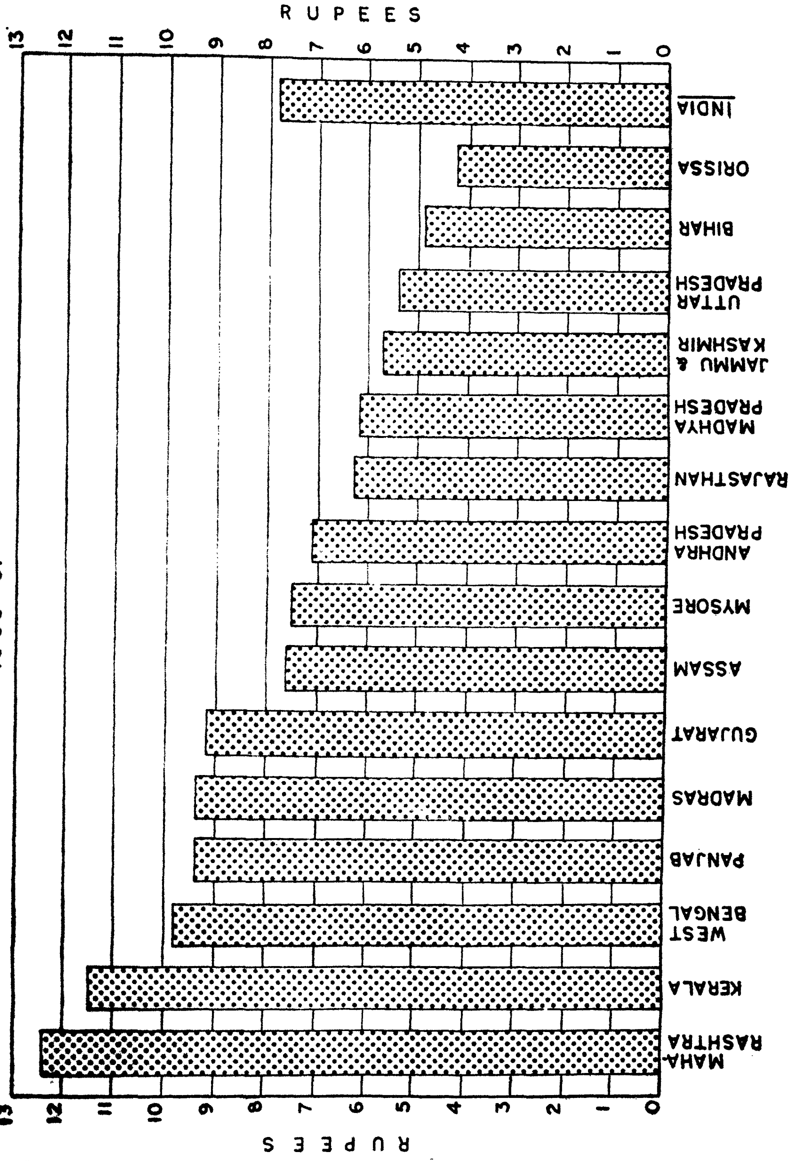
State	Income per capita	Expenditure on education per capita	Percentage of expenditure on education to State income	Illiterate persons per 1,000 of population		Enrolment ratios						Enrolment in higher education per 10,000 of population
						Classes I-V		Classes VI-VIII		Classes IX-XI		
				Males	Females	Boys	Girls	Boys	Girls	Boys	Girls	
1	2	3	4	5	6	7	8	9	10	11	12	13
	Rs.	Rs.	%			%	%	%	%	%	%	
Andhra Pradesh .	287·0	7·1	2·5	608	880	84·3	52·2	26·1	7·6	14·4	2·7	16
Assam .	333·3	7·6	2·3	627	840	84·7	50·4	36·4	14·6	25·5	7·0	23
Bihar .	220·7	4·9	2·2	702	931	76·0	24·1	29·3	3·7	21·5	1·6	20
Gujarat .	393·4	9·2	2·3	589	809	90·1	52·9	36·6	15·2	19·0	6·2	24
Jammu & Kashmir	289·0	5·7	2·0	830	957	71·0	20·7	37·9	9·5	14·5	4·7	25
Kerala .	314·9	11·5	3·6	450	611	115·4	100·0	67·7	49·1	20·2	12·6	26
Madhya Pradesh .	285·4	6·2	2·2	730	933	75·0	22·4	25·6	5·4	11·2	2·0	15
Madras .	334·1	9·4	2·8	555	818	104·8	65·9	44·4	19·1	19·5	6·3	21
Maharashtra	468·5	12·4	2·6	580	832	95·1	58·4	39·2	15·3	20·3	6·7	28
Mysore .	304·7	7·5	2·5	639	858	91·9	55·3	32·3	12·5	17·4	4·8	22
Orissa .	276·2	4·3	1·5	653	914	59·3	39·0	16·1	2·0	7·5	0·7	8
Punjab .	451·3	9·3	2·1	670	859	65·0	34·7	44·3	12·6	19·8	4·7	31
Rajasthan .	267·4	6·3	2·4	763	942	64·0	16·3	24·1	4·1	10·3	1·1	16
Uttar Pradesh	297·4	5·4	1·8	727	930	68·8	19·5	27·1	5·1	13·2	1·8	34
West Bengal	464·6	9·8	2·1	599	830	83·7	45·9	31·3	11·5	15·1	4·3	40
ALL-INDIA	334·5	7·8	2·4	655	870	82·5	41·4	33·2	11·3	16·6	4·1	25

Source. (1) Ministry of Education, Form A. except as stated below.
(2) Study carried out by the National Council of Applied Research for column. 2.
(3) Census of India, for columns 5 and 6.

It will be seen that the State income per head is lowest in Bihar (Rs. 220.7) and the highest in Maharashtra (Rs. 468.5). The percentage of State income devoted to education is lowest in Orissa (1.5) and highest in Kerala (3·6). Illiteracy, both among men and women, is lowest in Kerala (450 and 611 respectively) per 1,000 of population), and highest in Jammu and Kashmir (830 and 957 respectively). At the lower primary stage, the enrolment of boys and girls is highest in Kerala (115·4 p.c. and 100 p.c. respectively of the corresponding age-group) and lowest in Rajasthan (64·0 p.c. and 16:3 p.c. respectively). At the higher primary stage, Kerala again stands first (67·7 and 49.1 p.c. respectively for boys and girls), while Orissa comes last (16.1 p.c. for boys and 2·0 p.c. for girls). At the secondary stage. Assam is first for the enrolment of boys (25·5 p.c.) and Kerala first for the enrolment of girls (12·6 p.c.). But in both respects, Orissa stands last (7·5 p.c. for boys and 0·7 p.c. for girls). In higher education, West Bengal stands first with an enrolment of 40 per 10,000 of population and Orissa comes last, with an enrolment of 8 only. (See also chart on page 127).

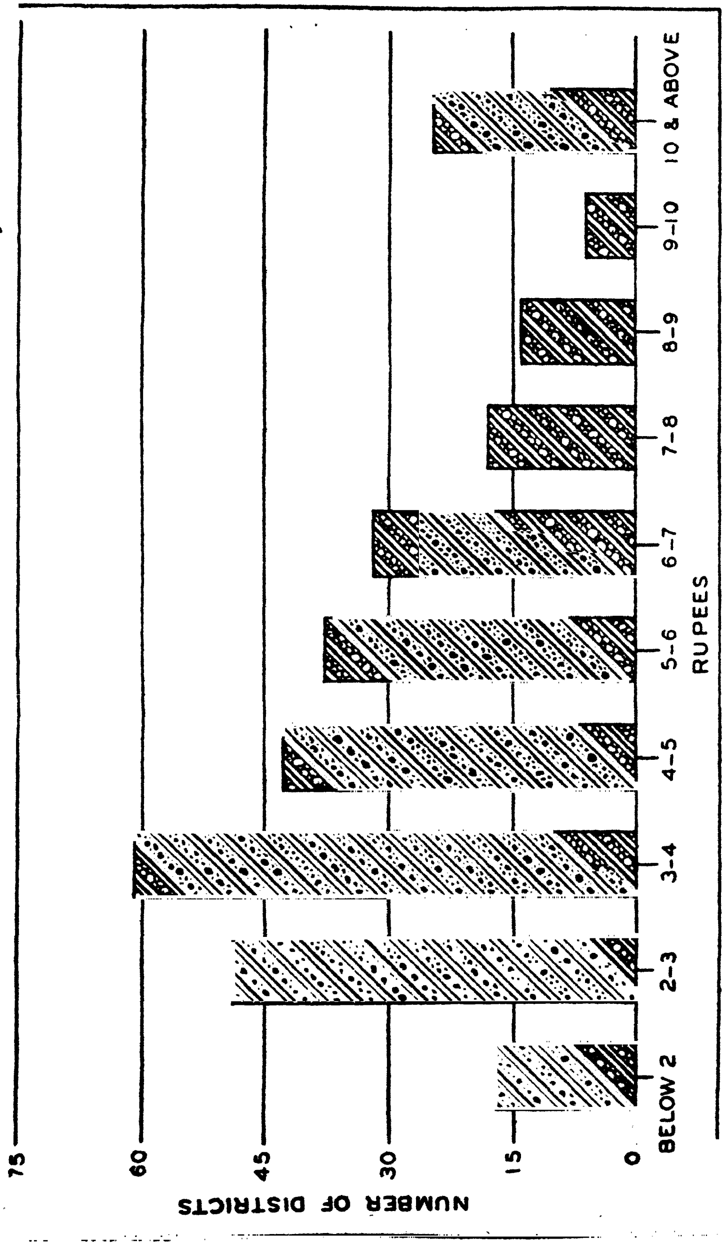
6.51. **Imbalances in Educational Development in the Districts**. The differences at the district level are much greater than those at the State level. Some of the most striking conclusions that emerged from our study in this regard are given below:

(1) *Lower Primary Stage (Classes I—V)*. At the lower primary stage, the target to be reached is an enrolment of 142 per thousand (at 110 per cent of the total population in the age group 6—10). As against this, there is a wide spectrum of



EXPENDITURE ON EDUCATION, PER CAPITA 1960-61

DISTRIBUTION OF DISTRICTS ACCORDING TO PER CAPITA EXPENDITURE ON EDUCATION, 1960-61



achievement. At the State level, in case of total enrolment it ranges from 55 in Rajasthan to 140 in Kerala while in the case of girls it ranges from 23 in Rajasthan to 130 in Kerala. The mean enrolment of all children for all States was 74 with a standard deviation of 24.6. The mean for girls was 46.7 with a standard deviation of 23.8. The variations between districts are even larger—from 21 in Barmer (Rajasthan) to 158 in Quilon (Kerala) for total enrolment and from 5 in Barmer to 151 in Quilon for girls. The districts with lowest and highest enrolments per 1,000 of population are given below (see also charts on pages 130 and 131):

Districts with Lowest Total Enrolment		Districts with Highest Total Enrolment	
District	Enrolment (per 1,000)	District	Enrolment (per 1,000)
1. Barmer (Rajasthan)	21	1. Quilon (Kerala)	158
2. Coorg (Mysore)	32	2. Alleppey (Kerala)	156
3. Jaisalmer (Rajasthan)	33	3. Trivandrum (Kerala)	148
4. Jalore (Rajasthan)	33	4. Ernakulam (Kerala)	147
5. Gulbarga (Mysore)	35	5. Kanya Kumari (Madras)	147

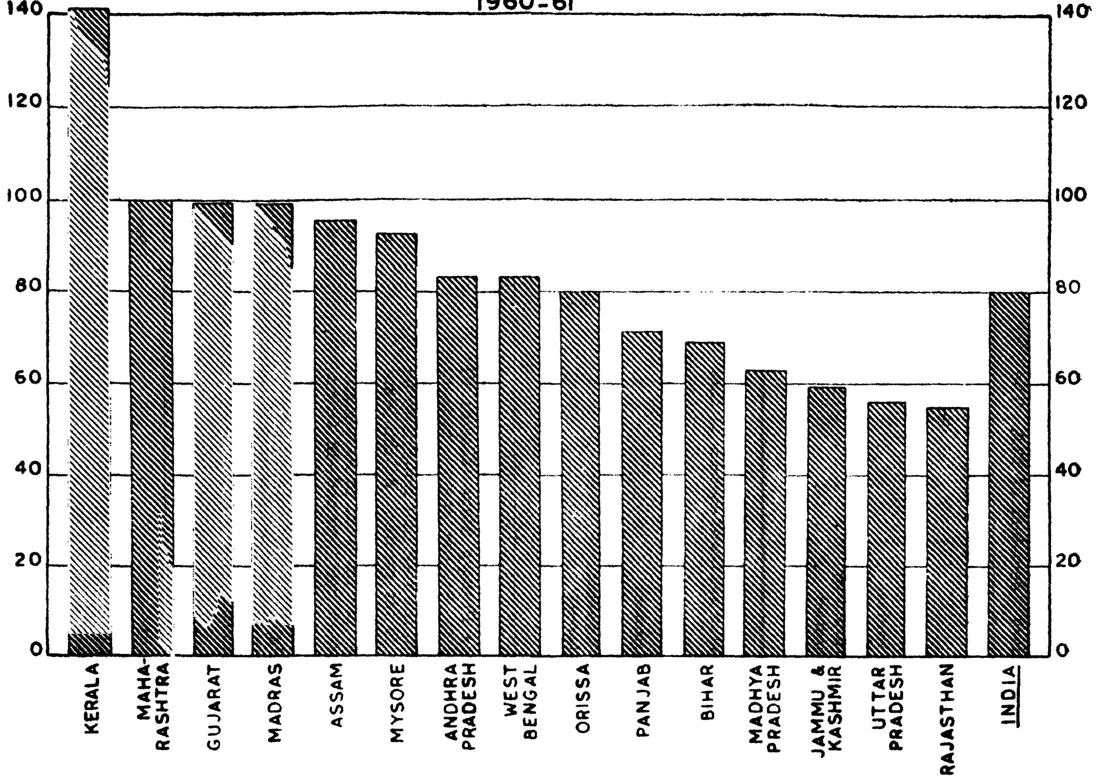
Districts with Lowest Enrolment of Girls		Districts with Highest Enrolment of Girls	
District	Enrolment (per 1,000)	District	Enrolment (per 1,000)
1. Barmer (Rajasthan)	5	1. Quilon (Kerala)	151
2. Sidhi (Madhya Pradesh)	7	2. Alleppey (Kerala)	147
3. Jaisalmer (Rajasthan)	8	3. Kottayam (Kerala)	141
4. Jalore (Rajasthan)	8	4. Kanya Kumari (Madras)	139
5. Tehri Garhwal (Uttar Pradesh)	8	5. Mizo (Assam)	138

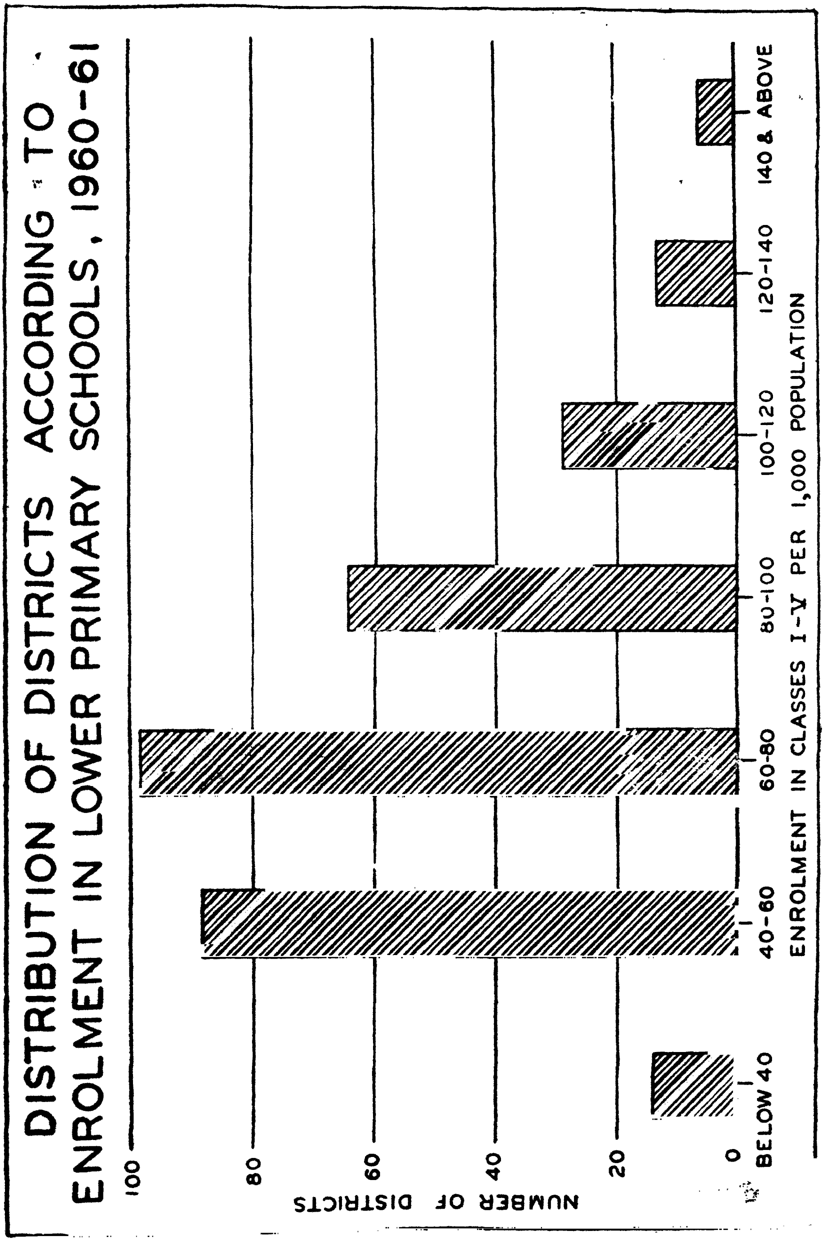
Target. An enrolment of 142 per thousand in total and 143 for girls.

(2) *Higher Primary Stage (Classes VI—VIII)*. At the higher primary stage, the picture is similar, although the task that remains to be done is far greater. At the State level, the highest total enrolment was 41 per thousand in Kerala and lowest—5 per thousand—in Orissa. In respect of girls, the highest enrolment was 35 per thousand, again in Kerala, while it was lowest—1 per thousand—in Orissa, 2 per thousand in Bihar and 3 per thousand in Madhya Pradesh, Rajasthan and Uttar Pradesh. The mean and standard deviations for all States were 13·7 and 8·3 in the case of all children and 6·7 and 7·3 in the case of girls. The variations between the districts, which are wider, are given below (see also charts on pages 133 and 134):

Districts with Lowest Total Enrolment		Districts with Highest Total Enrolment	
District	Enrolment (per 1,000)	District	Enrolment (per 1,000)
1. Kalahandi (Orissa)	2	1. Alleppey (Kerala)	59
2. Koraput (Orissa)	2	2. Quilon (Kerala)	53
3. Barmer (Rajasthan)	3	3. Kottayam (Kerala)	48
4. Bastar (Madhya Pradesh)	3	4. Trivandrum (Kerala)	46
5. Bolangir (Orissa)	3	5. Trichur (Kerala)	44

ENROLMENT AT LOWER PRIMARY STAGE (CLASSES I-V)
PER THOUSAND POPULATION
1960-61





DISTRIBUTION OF DISTRICTS ACCORDING TO ENROLMENT IN LOWER PRIMARY SCHOOLS, 1960-61

Districts with Lowest Enrolment of Girls		Districts with Highest Enrolment of Girls	
District	Enrolment (per 1,000)	District	Enrolment (per 1,000)
1. Sidhi (Madhya Pradesh)	0·1	1. Alleppey (Kerala)	53
2. Kalahandi (Orissa)	0·2	2. Quilon (Kerala)	46
3. Jalore (Rajasthan)	0·3	3. Kottayam (Kerala)	45
4. Barmer (Rajasthan)	0·3	4. Trivandrum (Kerala)	41
5. Jaisalmer (Rajasthan)	0·5	5. Trichur (Kerala)	37

Target: An enrolment of 75 per thousand, both for total and for girls (110 p.c. of the age-group 11-13).

(3) *Secondary Education Stage (Classes IX—XI).* Kerala again stands first with an enrolment of 11 per thousand of population for total enrolment and 8 per thousand of population for girls, while Orissa stands last with an enrolment of 2 per thousand for all children and a negligible enrolment for girls. The mean enrolment for all States was 6.29 for total (with a standard deviation of 3.5) and that for girls was 2.21 (with a standard deviation of 2·8). At the district level, the differences are even greater as the following figures will show (see also chart on page 137):

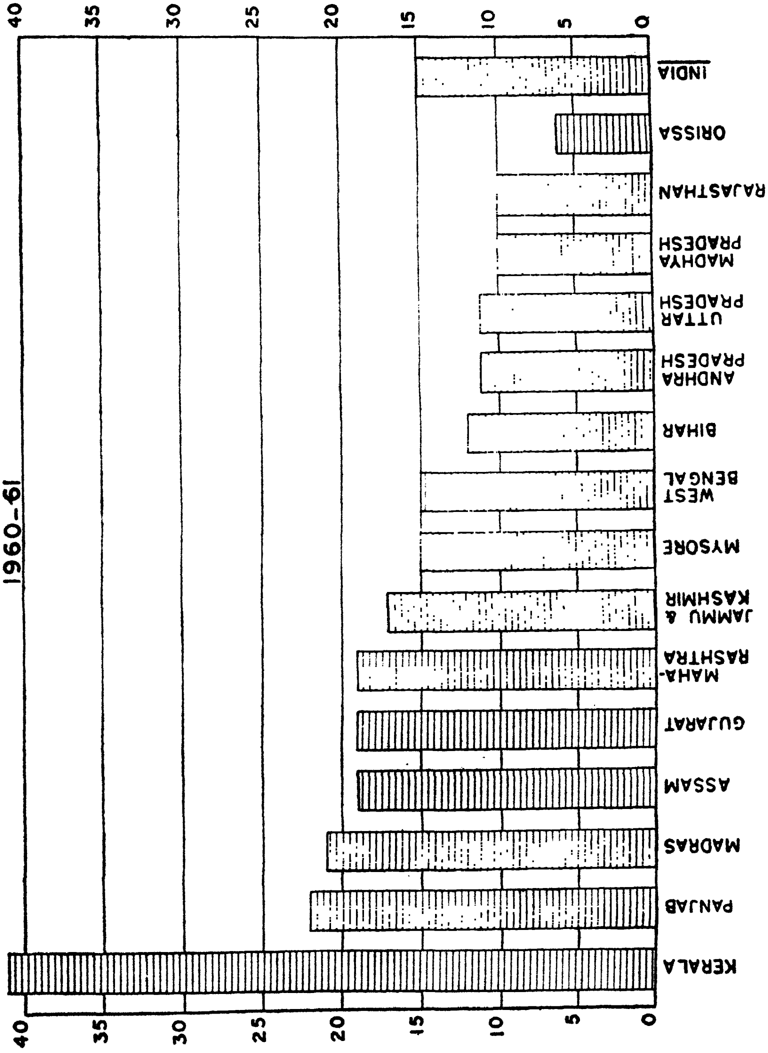
Districts with Lowest Total Enrolment		Districts with Highest Total Enrolment	
District	Enrolment (per 1,000)	District	Enrolment (per 1,000)
1. Kalahandi (Orissa)	1	1. Greater Bombay (Maharashtra)	23
2. Baudhi Khondmal (Orissa)	1	2. Dehra Dun (U.P.)	21
3. Sidhi (Madhya Pradesh)	1	3. Kanya Kumari (Madras)	20
4. Bastar (Madhya Pradesh)	1	4. Alleppey (Kerala)	18
5. Ladakh (Jammu & Kashmir)	1	5. Ambala (Punjab)	18

Districts with Lowest Enrolment of Girls		Districts with Highest Enrolment of Girls	
District	Enrolment (per 1,000)	District	Enrolment (per 1,000)
1. Ladakh (J & K)	0·01	1. Greater Bombay (Maharashtra)	20
2. Sidhi (Madhya Pradesh)	0·02	2. Kanya Kumari (Madras)	15
3. Jalore (Rajasthan)	0·03	3. Dehra Dun (U.P.)	14
4. Kalahandi (Orissa)	0·06	4. Madras Corporation	13
5. Barmer (Rajasthan)	0·07	5. Calcutta Corporation	12

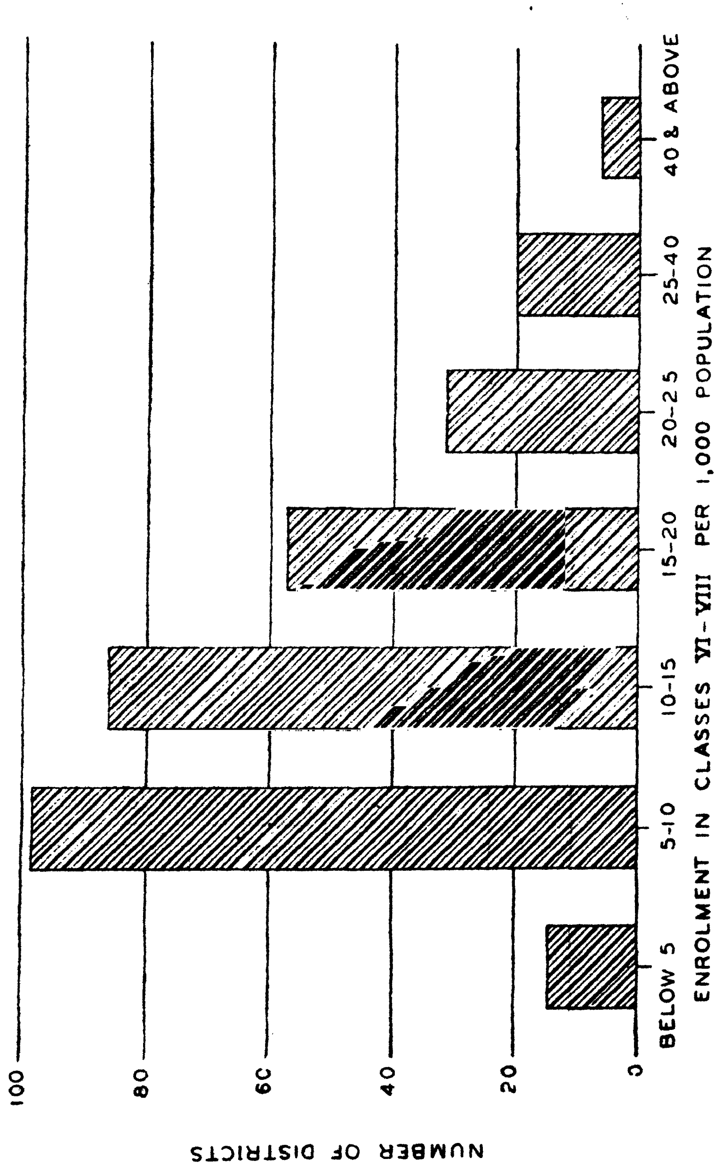
Target for 1986. 27 per 1,000 population.

(4) *Educational Expenditure (Direct) per Head of Population.* With regard to total direct expenditure per capita, Kerala spends highest (Rs. 11.2) and Orissa lowest (Rs. 2.8). There are 17 districts which spend less than Rs. 2.00 and 25 districts which spend more than Rs. 10 per head of population. The five districts with the highest and the lowest expenditure per head of population on education are given on page 135.

ENROLMENT AT HIGHER PRIMARY STAGE (CLASSES VI-VIII) PER THOUSAND POPULATION 1960-61



DISTRIBUTION OF DISTRICTS ACCORDING TO ENROLMENT IN HIGHER PRIMARY SCHOOLS, 1960-61



District with lowest educational expenditure		Districts with highest educational expenditure (excluding city districts)	
District	Expenditure per head	District	Expenditure per head
	Rs.		Rs.
1. Kalahandi (Orissa)	1·1	1. Poona (Maharashtra)	16·2
2. Mohindergarh (Punjab)	1·2	2. Trivandrum (Kerala)	15·6
3. Koraput (Orissa)	1·3	3. Nagpur	15·3
4. Bolangir (Orissa)	1·5	4. Sehore (Madhya Pradesh)	14·3
5. Fatehpur (U.P.)	1·5	5. Trichur (Kerala)	14·2

The chart on page 128 shows the distribution of districts according to per capita expenditure on education.

6.52. **Recommendations.** The programmes for the reduction of regional imbalances in educational development will have to be pursued side by side with the wider programmes for removing imbalances in the socio-economic development. The problem is complex and difficult; and its solution will have to be spread over a number of years. Our principal object in this Report is to draw attention to this problem and to highlight its significance. In our opinion, the solution of the problem can be considerably facilitated if an emphasis is laid on removal of imbalances in educational development. From this point of view, we suggest that action should be taken on the following lines:

(1) A total elimination of these differences in educational development is neither possible nor desirable. In the larger interests of the country each region should be free to strive its best and to develop at its own pace. This will necessarily lead to some inequalities of development. But what is needed is a balancing factor, a deliberate and sustained effort to assist the less advanced areas to come up to at least certain minimum levels so that the gap between them and the advanced areas would be reduced to the minimum. This is the policy of 'equalization' under which each area is assisted, subject to the condition that it makes a given effort to come up to certain minimum levels prescribed. Our grants-in-aid in education will have to be broadly based on this principle of equalization.

(2) The district should be adopted as the basic unit for educational planning and development. Our detailed proposals in this regard will be discussed elsewhere.[1]

(3) At the State level, there should be a deliberate policy of equalization of educational development in the different districts and the necessary administrative and financial measures to this end should be taken.

(4) At the national level, it should be regarded as the responsibility of the Government of India to secure equalization of educational development in the different States. The necessary programmes for this, including special assistance to the less advanced States, should be developed.

EDUCATION OF GIRLS

6.53. The significance of the education of girls cannot be over-emphasized. For full development of our human resources, the improvement of homes, and for moulding the character of children during the most impressionable years of infancy, the education of women is of even greater importance than that of men. As stated earlier, the education of women can assist greatly in reducing the fertility rate. In the modern world, the role of the woman goes much beyound the home and the bringing up of children. She is now adopting a career of her own and sharing equally with man, the responsibility for the development of society in all its aspects. This is the direction in which we shall have to move. In the struggle for freedom, Indian women fought side by side with men. This equal partnership will have to continue in the fight against hunger, poverty, ignorance and ill-health.

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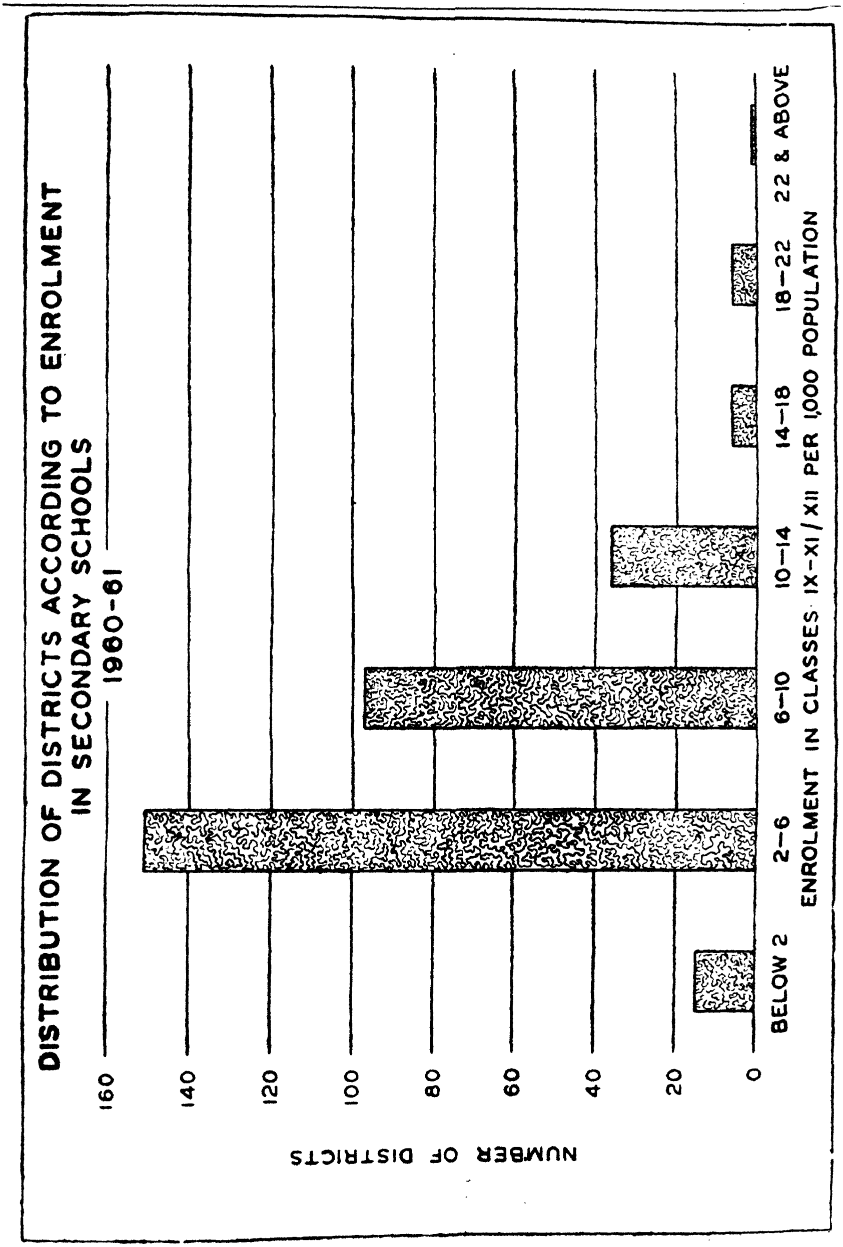
[1] Chapter XVIII.

6.54. **Development of the Education of Girls (1950-51 to 1965-66).** There has been a phenomenal development in the education of women—one of the most distinctive characteristics of life in modern India—in the last 150 years. At the beginning of the nineteenth century, there was hardly any provision for the formal education of girls. Even at the opening of the present century, not much progress had been made. In 1901, the percentage of literacy amongst women was only 0.8. The number of girls enrolled for every 100 boys was only 12 at the primary stage and 4 at the secondary. The total enrolment in higher education was only 264 (which included 76 girls reading in medical colleges and 11 in colleges of education). Much faster progress was made in the next 50 years, both in raising their social status and in developing their education; and the progress in the last fifteen years has been almost phenomenal. This will be seen from the statistics given in Table 6.7.

TABLE 6·7. EDUCATION OF GIRLS (1950—1965)

	1950-51	1955-56	1960-61	1965-66 (Estimated)
1. *Enrolment of Girls in Classes I—V*				
(1) Total enrolment (in 000's)	5,385	7,639	11,401	18,145
(2) No. of girls for every 100 boys enrolled	39	44	48	55
(3) Percentage of girls in schools for boys	74·8	79·2	82·1	85·0
2. *Enrolment of Girls in Classes VI-VIII*				
(1) Total enrolment (in 000's)	534	867	1,630	2,839
(2) No. of girls for every 100 boys enrolled	21	25	32	35
(3) Percentage of girls in schools for boys	26·7	51·8	68·9	78·0
3. *Enrolment of Girls in Classes IX-XI*				
(1) Total enrolment (in 000's)	163	320	541	1,069
(2) No. of girls for every 100 boys enrolled	15	21	23	26
(3) Percentage of girls in schools for boys	21·0	29·7	36·4	40·0
4. *Enrolment of Girls at the University Stage (General Education)*				
(1) Total enrolment (in 000's)	40	84	150	271
(2) No. of girls for every 100 boys enrolled	14	17	23	24
(3) Percentage of girls in boys' institutions	56·0	53·1	50·2	48·2
5. *Enrolment of Girls in Vocational Courses (School Standard)*				
(1) Total enrolment (in 000's)	41	66	86	120
(2) No. of girls for every 100 boys enrolled	28	31	25	23
6. *Enrolment of Girls in Professional Courses (Collegiate Standard)*				
(1) Total enrolment (in 000's)	5	9	26	50
(2) No. of girls for every 100 boys enrolled	5	7	11	14

Source. Ministry of Education, Form A, except for the year 1965-66 estimates for which were made in the Secretariat of the Education Commission.



DISTRIBUTION OF DISTRICTS ACCORDING TO ENROLMENT IN SECONDARY SCHOOLS

1960-61

Some interesting points emerge from this data. The rate of expansion of education of girls is much faster than that among the boys so that the gap between them is gradually and steadily narrowing. At the lower primary stage, the number of girls enrolled per 100 boys has increased from 12 in 1901 to 39 in 1950 and to 55 in 1965. At the secondary stage, the corresponding figures are 4 in 1901, 15 in 1950 and 26 in 1965. In higher education, their enrolment has increased from a mere 264 in 1901 to 40,000 in 1950 and to 240.000 in 1965. Education in mixed schools is being more accepted at the lower primary stage where 85 per cent of the girls enrolled are in mixed schools and at the higher primary stage where the proportion is 78 per cent. But there is still a considerable resistance to it at the secondary stage where only 40 per cent of the girls enrolled are in mixed schools. These resistances, however, soften down to some extent at the university stage.

6.55. **Recommendations.** The problem of women's education has in recent years been examined by a number of committees: the National Committee on the Education of Women under the chairmanship of Smt. Durgabai Deshmukh: the Committee on Differentiation of Curricula between Boys and Girls under the chairmanship of Smt. Hansa Mehta: and the Committee under the chairmanship of Shri M. Bhaktavatsalam which studied the problem in the six States where the education of girls is less developed. We fully endorse the recommendations of these Committees.

6.56. In our opinion, the strategy for the development of the education of girls and women will have to take two forms. The first is to emphasize the 'special' programmes recommended by the National Committee on Women's Education: and the second is to give attention to the education of girls at all stages and in all sectors as an integral part of the general programmes for the expansion and improvement of education. With regard to the first, we recommend that, as suggested by the National Committee, action should be taken on the following lines:

(1) The education of women should be regarded as a major programme in education for some years to come and a bold and determined effort should be made to face the difficulties involved and to close the existing gap between the education of men and women in as short a time as possible;

(2) Special schemes should be prepared for this purpose and the funds required for them should be provided on a priority basis: and

(3) Both at the Centre and in the States, there should be a special machinery to look after the education of girls and women. It should bring together officials and non-officials in the planning and implementation of programmes for women's education.

These special programmes, by their very nature, are temporary and will have to be pursued only till the gap between the education of boys and girls is almost bridged. But they should not be made an excuse for neglecting the second aspect of the strategy, *viz.*, giving adequate attention to the education of girls at all stages and in all sectors. In fact, if this had been done right from the beginning, the need for special programmes would hardly have arisen. In our opinion, a stage has now been reached when intensive effort should be made to develop this aspect of the strategy so that the need for special programmes will disappear in the course of a few years.

6.57. The role of women outside the home has become an important feature of the social and economic life of the country and in the years to come, this will assume large proportions affecting a majority of women. It will, therefore, be necessary to pay adequate attention to the problems of training and employment of women.

(1) An important problem is to enable women to carry out their dual role of home-making and following a suitable career. The Census of 1961 shows that there are at present more than a million young women, below the age of 24 and with a minimum qualification of matriculation, who are working only as house-wives—and this number will increase still further in the days ahead. To enable these women to participate in programmes of national reconstruction, opportunities for part-time employment will have to be greatly increased. In addition, they will

have to be drawn, wherever possible, into all types of nation-building aitivities on an honorary basis as well.

(2) Side by side, opportunities for full-time employment will also have to be expanded. As the age of marriage continues to rise, full-time employment will have to be provided for almost all young unmarried women. It may also be expected that, as in other countries, once their children reach a school-going age, women will have a great deal of time on their hands and will desire to spend it usefully by taking up full-time employment. This need also will have to be satisfactorily met. Teaching, nursing and social service are well-recognised areas where women can have a useful role to play. Opportunities for women will have to be largely expanded in these fields and several new avenues, covering almost all the different walks of life will have to be opened out.

6.58. Our recommendations regarding different aspects of women's education have been given, in the appropriate context in this Report, along with those for the education of boys.

EDUCATION OF SCHEDULED TRIBES

6.59. **The Problem.** It is necessary to pay special attention to the education of children from the backward classes which include the Scheduled Castes, the Scheduled Tribes, denotified communities and a few nomadic and semi-nomadic groups.

(1) In so far as the Scheduled Castes are concerned, the problem has become a little easier because of the diminution in the rigour of untouchability. For its early solution, however, we recommend that the existing programmes for the education of the Scheduled Castes should continue and be expanded.

(2) With regard to the last category, it may be stated that there are several nomadic and semi-nomadic groups in the country whose educational needs have been hitherto neglected almost completely. It will not be easy to provide educational facilities for such groups. To the extent possible, such groups have to be assisted in developing more settled ways of living. This calls for a degree of fundamental re-organization in their economy and their way of life and, therefore, for close study of their problems with a view to evolving solutions which will meet their needs and secure their co-operation. While such a process of change would only be carried out over several years, efforts have to be made to provide marketing, credit, health and educational facilities in a mobile form wherever there are sizeable nomadic groups. Similar facilities are required for communities which migrate from their homes for several months in the year.

(3) The problem of denotified communities is small in magnitude, but extremely difficult. Patient work over years is needed. Provision of hostels where the children from these communities can live and grow up in a proper atmosphere is probably the best solution in the long run.

In this section, we shall deal mainly with the education of the Scheduled Tribes which, in our opinion, deserve special emphasis.

6.60. Tribal people[1] generally live in forest areas which are difficult of access and where conditions of life can be very trying. Some of them live in small concentrations in the midst of a non-tribal population; but the larger proportion of tribal people live in areas which are predominantly inhabited by the tribals themselves. Examples of these are groups of districts in Madhya Pradesh, Bihar, Orissa, the hill districts of Assam and other areas in the North-Eastern region.

6.61. The problem is comparatively simple in the former case where the tribals live in 'small pockets' or they are mixed up as it were with the rest of the population and constitute a smaller part. In such cases, special attention will have to be paid to the needs of the tribals to ensure that they receive a fair share of the benefits of educational development. But the situation becomes uniquely challenging in the predominantly tribal areas because here is presented an ideal opportunity for an integrated development to which we referred earlier.[2] In all these areas, three tasks stand out above all others. These are firstly, development of communications; secondly, transformation of the present system of shifting cultivation into a developing agricultural economy, including care of forests, improved systems of shifting cultivation, settled cultivation and pasture; and thirdly, development of a system of education related to the scheme of economic and social development and responsive to the cultural and economic needs of the people.

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[1] We are not very happy with the word 'tribal'. It has certain overtones which are resented, and rightly so, by the tribal people. We recommend that the Government of India should adopt a suitable alternative phrase to describe these brethren of ours. In the meanwhile, we have reluctantly retained the use of the word.

[2] Chapter V.

6.62. The problems of education among the tribals have received a good deal of attention in recent years. They were examined in detail by the Commission on Scheduled Areas and Scheduled Tribes under the chairmanship of Shri U.N. Dhebar. They were also discussed in two seminars organized by the Planning Commission in New Delhi and by the NCERT at Udaipur. We broadly agree with their recommendations.

6.63. **Present Position.** The latest available statistics for the education of the Scheduled Tribes are for 1960-61 and have been summarised in Table 6.8. The principal object of the table is to compare the education of the Scheduled Tribes with that of the general population of the State. For instance, if the proportion of the Scheduled Tribes population in Madhya Pradesh is 20.6 per cent, and if their educational progress were the same as that of the general population, we should expect that the percentage of enrolment would also be the same. But this is never the case. In some cases (*e.g.*, primary education in Assam), the enrolment of tribal children is greater than that of the general population[1], showing thereby that the tribals are a little more educationally advanced than the average citizen. On the other hand, the percentage of their enrolment is very much lower in most areas and shows the extent of their educational backwardness.

TABLE 6.8. EDUCATION AMONG THE SCHEDULED TRIBES (1961)

State	Percentage of Scheduled Tribes population to total population of the State	Percentage of enrolment of Scheduled Tribes to total enrolment: Lower primary	Higher primary	Secondary	Higher education	Vocational and professional education	Grand total
Andhra Pradesh	3.7	2.3	0.7	0.6	0.4	1.8	1.9
Assam	17.4	24.0	16.2	9.3	9.8	32.9	20.9
Bihar	9.1	8.7	7.4	3.7	2.4	7.1	7.6
Gujarat	13.3	12.4	7.5	1.9	0.2	12.0	8.1
Jammu & Kashmir	..	..	..	..	..	..	..
Kerala	1.2	0.5	0.4	0.2	..	0.1	0.4
Madhya Pradesh	20.6	12.3	6.5	2.2	2.2	5.0	9.7
Madras	0.7	0.5	0.1	0.2	0.8	0.3	0.4
Maharashtra	6.1	6.6	0.1	1.0	0.6	2.6	3.4
Mysore	0.1	0.7	0.2	0.2	0.1	0.4	0.6
Orissa	..	..	..	..	..	..	..
Punjab	0.1	0.1	0.1	0.1	0.2	0.3	0.1
Rajasthan	11.5	2.3	0.9	0.6	0.5	4.5	1.9
Uttar Pradesh	..	..	..	..	..	..	..
West Bengal	5.9	3.5	3.2	1.4	0.3	8.5	3.4

Source. Ministry of Education Form A. Data for Orissa were not available. Population of Scheduled Tribes in Jammu and Kashmir and Uttar Pradesh was negligible.

It will be seen from the above table that the education of tribals is relatively better developed at the lower primary stage only in some States *e.g.*, Assam, Gujarat or Maharashtra. Even at this stage, the position is far from happy in States like Madhya Pradesh or Rajasthan. There is a sudden drop in enrolments after the lower primary stage in all parts of the country. This shows that the wastage among the tribals is much greater than in the population as a whole. The principal weakness in tribal education is really in the age-group 11-17 or higher primary and lower secondary education where the programme of scholarships and other assistance is not adequately developed. This is where talent is either eliminated or remains underdeveloped and, in our opinion, it is this area to which greater attention will have to be paid in the future. There is a slight improvement of enrolments in higher education because of the central programme of scholarships. Vocational education is obviously more popular with the tribal students everywhere. The tribals have a natural aptitude for such practical programmes and these deserve every encouragement.

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[1] This does not mean that all tribes are equally advanced. Even in Assam, there are extremely backward tribes like Mikirs and educationally advanced tribes like the Mizos.

6.64. **Primary Education.** Intensive efforts will have to be made among the tribal people to provide five years effective education for all children by 1975-76. This will need an intensive programme of parental education. Special encouragement should be given to the education of girls and this will not be difficult because women have a good status in tribal life. The teachers should be invariably conversant with the tribal languages. The medium of education in the first two years of the school should be the tribal language and books should be specially prepared in these languages (using the script of the regional language) for use at this stage. During this period, the children should be given oral instruction in the regional language and their familiarity and command over it should be improved. By the third year, the regional language should be the medium of education. There will be no difficulty in this because the children will already have learnt the script and been familiar with the language.[1]

6.65. It is necessary to improve the provision of educational facilities which are often very meagre. In very sparsely populated areas, Ashram Schools will have to be established in large numbers. To attract children to schools and to hold them, the working and programmes of the schools should be made to harmonize with the environment. Vacations and holidays should coincide with agricultural and forest operations and social festivities. The school hours should be fixed to suit the work the children are required to do for their families. These measures are needed for the rural population as a whole. But they are of special significance for tribal education. Moreover, the introduction of work-experience and an emphasis on art education would attract the tribal children as would the teaching of folk songs, stories and riddles which are so popular with the tribals. Tribal games and archery as well as tribal music and dances should be introduced as extra-curricular activities.

6.66. **Secondary Education.** Far greater attention will have to be paid, as stated earlier, to the development of higher primary and secondary education among the tribals. For this a programme of hostels is very essential. Brighter children should be picked up at the lower primary stage and admitted to hostels. Careful arrangements should also be made for giving personal guidance and some extra tuition to these children so that they will be able to perform better in comparison with the non-tribal students. The additional expenditure on such extra tuition will be small; but it will greatly enhance the effectiveness of the large expenditure on hostels which we incur at present. The scheme of Ashram Schools is very good from this point of view. It should be developed as largely as possible.

6.67. Tribal children find difficulties in getting admission to good higher primary or secondary schools. The Education Departments would have to make special efforts to secure such admission and, if necessary, offer some inducements to the schools for this purpose. Where admission to such schools requires a better preparation on the part of the students, special measures should be taken to provide this coaching to tribal students and to bring them up to the required standard. As stated earlier, tribals are fond of vocational courses. Special efforts should, therefore, be made to place them in good vocational schools, the junior technical schools, the industrial training institutes, polytechnics, etc. Special vocational schools should also be organized for the grown-up children who leave school at the end of the lower primary stage.

6.68. **Higher Education.** It is necessary to streamline the administration of the scholarships programme instituted by the Government of India. In this context, we make the following recommendations:

(1) The administration of scholarships and other aids needs to be decentralized a great deal. Heads of institutions should be authorized to grant scholarships, along with admission, on their own authority. For this purpose, the necessary amount should be placed at their disposal well in advance of the academic year. This could be done on the basis of the previous year's expenditure with a margin for increase.

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[1] Where the Roman script is already being used for tribal languages, the practice may be continued.

(2) The scope of the programme should be expanded to include, not only the provision of funds but also the provision of such additional coaching facilities as may be required, watching of progress, planning ahead of careers and ensuring placement in appropriate institutions, or in other words to provide for a personal follow-up. The staff necessary for this purpose should be made available.

(3) The scope of scholarships should cover all courses available to secondary school leavers; and special preference should be given to vocational and technical courses, including those at industrial training institutes.

6.69. **General.** The basic issue in the development of tribal life and education is the provision of leadership of the right type. For the next few years at any rate, this leadership will have to come from the non-tribal people—officials and non-officials—but the ultimate solution of the problem requires the development of a proper leadership among the tribals themselves. Our attempt in this field should, therefore, be directed to both these objectives.

6.70. There are not many non-tribal persons who want to live and work among the tribals. But a few individuals and institutions are devoted to this cause. They should be encouraged and provided with necessary funds so that they could recruit and train batches of young persons who would be willing to adopt the service of the tribals as their mission in life. Among the officials, the main difficulty is that of continuous transfers. No officer remains long enough in the tribal areas to understand their problems and to be able to identify himself with the tribal interests. Many of them are not even aware of the tribal language. In several tribal areas, we found a lack of rapport between the officials and the tribal people which probably was a major reason for the inadequate implementation of developmental schemes. To overcome this difficulty, it is necessary to have sub-cadres amongst officers in all departments. The persons in these sub-cadres will be selected for their competence and aptitude for work among the tribals. Once an officer is recruited to this cadre, his work should be watched for an year or two in the first instance and if it is found satisfactory, he should be retained in it for a period of 10 to 15 years at least and posted to work with the tribals. There should be special allowances or privileges to go with the cadre which should make it attractive enough for the better type of officers to compete for admission to it. Such special cadres are very necessary for teachers. We have discussed this problem elsewhere.[1]

6.71. To develop leadership among the tribal people themselves, some unorthodox approaches are necessary. It is but natural that young tribals who have received secondary or higher education should go out of their areas in search of employment. The work among the tribal areas would, therefore, have to be done, for some years to come, by tribals who have received comparatively less formal education but whose identification with their people would be deeper and greater. It is necessary to pick up such young persons, give them training through specially organized courses and use them as our workers for tribal uplift. In doing so, several of the formal rules of recruitment will have to be set aside. But probably this is the only way in which some tangible progress can be made in the immediate future.

6.72. Different tribal people are at varying stages of economic and cultural development. There is much difference in the skills they have attained and in the technology they employ. Therefore, in predominantly tribal areas, each group and the area in which it lives, should be studied closely, and appropriate patterns of development worked out in close cooperation with the people. It is in terms of such a design of development that educational programmes, institutions and priorities should be proposed. A uniform approach as between different tribal areas, applied in a mechanical manner, will not secure the purpose in view.

6.73. To be able to do justice to the tasks and problems of tribal education, it is important that the Ministry of Education at the Centre and the Departments of Education in those States which have sizeable tribal populations, should be equipped with special sections or units whose task it would be to study the needs of the tribal people and assist in developing educational systems best calculated to promote their welfare and development. These sections or units should work in close collaboration with other Ministries or Departments involved in the programme. Aspects of tribal education which might call for special attention will vary from area to area, and no pains should be spared in understanding the problems which arise in different contexts.

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[1] Chapter III.

6.74. There is a very great dearth of statistical information regarding the spread of education among the tribal people. It is necessary to collect this data and, we welcome the introduction of the new forms designed for this purpose by the Ministry of Education. In addition, it is necessary to carry out special investigations regarding important aspects of the spread of education amongst the tribals and their effects. A contnous programme of research and evaluation has to be developed for this purpose. Although the tribal research institutes have a special role to play in this, it would be desirable to involve the universities also. We recommend that the UGC should set aside a fund for such research to be conducted through selected universities and special institutions.

6.75. The education of the backward classes in general and of the tribal people in particular is a major programme of equalization and of social and national integration. No expenditure is too great for the purpose.

PART TWO

EDUCATION AT DIFFERENT STAGES AND IN DIFFERENT SECTORS

In this part of our Report, we examine the special problems relating to the different stages and sectors of education.

I. **Chapters VII-X.** These four chapters deal with problems of school education.

- *Chapter VII* deals with all problems of pre-primary education and problems of expansion at the primary and secondary stages.
- *Chapter VIII* deals with school curriculum from Class I to Class XII and covers all sub-stages—lower and higher primary and lower and higher secondary.
- *Chapter IX* deals with teaching methods, textbooks, teachers' guides and other teaching and learning materials, class-size, provision of physical facilities (especially buildings), guidance and counselling and evaluation.
- *Chapter X* deals with problems of administration and supervision. These include, amongst others, the creation of a common school system of public education, reorganization of the State Education Department at the district level, the State Institutes of Education, the State Evaluation Organizations, the State Boards of School Education, national standards and the role of the Centre in improving school education.

II. **Chapters XI-XIII**. These three chapters deal with problems of university education, both quantitative and qualitative.

- *Chapter XI* deals with improvement of higher education. It covers such topics as the objectives of university education, the scheme of major universities, methods of teaching and evaluation, medium of education and student services (including student discipline).
- *Chapter XII* deals with problems of expansion. It covers such topics as anticipated enrolments at the undergraduate and postgraduate stages during the next two decades, planning and location of colleges, the establishment of new universities, reorganization of courses for the first and second degrees, area studies, development of social sciences, education of women and educational research.
- *Chapter XIII* deals with problems of university government. Amongst others, it discusses the problems of university autonomy, grants-in-aid to universities and private colleges, appointment of vice-chancellors, university legislation, affiliated colleges, and reorganization of the UGC.

III. **Chapters XIV-XVI.** These three chapters deal with problems of agricultural and technical education and the development of scientific research.

- *Chapter XIV* deals with development of education for agriculture and covers such topics as agricultural universities, agricultural polytechnics, development of agricultural education at the undergraduate and postgraduate stages, and agricultural extension.
- *Chapter XV* deals with problems of vocational, technical and engineering education. Amongst others, it deals with the training of semi-skilled and skilled workers and technicians through the development of vocational, technical and engineering education at the school stage, the education of engineers (undergraduate and postgraduate stages) and the reorganization of of the administration of technical education.
- *Chapter XVI* deals with science education with special reference to the university stage and the development of scientific research.

IV. **Chapter XVII.** This deals with problems of adult education, including liquidation of illiteracy, provision of facilities for part-time and correspondence education, development of libraries, and the organization of university extension.

CHAPTER VII

SCHOOL EDUCATION: PROBLEMS OF EXPANSION

I. *An Integrated Approach to School Education.* (1).

II. *Pre-primary Education.* (3) Objectives; (4) Improvement of pre-primary education; (5) Recent developments in pre-primary education; (6) Recommendations.

III. *Primary Education: Fulfilment of the Constitutional Directive.* (8) Targets; (12) The programmes; (13) Universal provision of school facilities; (15) Universal enrolment of pupils; (16) Enrolment in Class I; (18) Enrolment in Class V; (19) Universal retention of pupils; (20) Stagnation; (21) Wastage; (24) Stagnation and wastage in Class I; (26) Stagnation and wastage in other classes; (27) Economic causes; (28) Literacy classes; (32) Part-time education at the higher primary stage; (33) Educational and social causes; (34) General observations.

IV. *Enrolments at the Primary Stage.* (36) Targets; (38) Education of girls; (39) Education of tribals; (40) Special assistance to underdeveloped areas; (42) Enrichment of the curricula and improvement of quality.

V. *Expansion of Secondary Education (Classes VIII-XII).* (43) General principles; (44) Enrolment in secondary education; (47) Vocational education; (49 Central grants for development of vocational education at the school stage; (50) Part-time education; (52) Education of girls.

VI. *Planning the Location of Schools.* (56) Primary schools; (60) Secondary schools; (62) Vocational schools.

AN INTEGRATED APPROACH TO SCHOOL EDUCATION

7.01. We have divided the entire period of formal education into two main stages—school and higher—and we have so far treated school education as one continuous unit. Some explanation for this procedure is necessary. The traditional practice has been to divide the period of school education into three stages—pre-primary, primary and secondary—and to discuss the problems of each separately. This is based on several considerations. In the first place, the three stages of education are regarded as corresponding to the three stages in the development of a child—infancy, childhood and adolescence. Again, from the social point of view, primary education has long been considered as education meant for the masses and secondary education for the select few. In our own country, distinctions have been made sometimes even on cultural grounds—primary education was defined as education through the modern Indian languages while secondary education was regarded as education in English. In recent years, however, these distinctions are either becoming blurred or have vanished altogether. For instance, it is increasingly realised that the dividing lines between pre-primary and primary or primary and secondary are arbitrary and variable. Similarly, the traditional view that primary education should provide undifferentiated general education while secondary education should be diversified to meet the varying aptitudes, interests and abilities of children is no longer universally held; and in some countries, such as the USSR, the entire course of school education—primary and secondary—has been designed on one set of principles. With the phenomenal expansion of secondary education in India, the social distinction between primary and secondary education as meeting respectively the needs of the masses and the classes has already ceased to be valid; and so has the justification for classifying primary as 'vernacular' education and secondary as 'English' education. We have found it, therefore, more convenient and appropriate to treat the entire pre-university period of education as one stage and have structured our Report accordingly. Such a treatment is almost inescapable for a proper planning and development of the school curriculum. It is true that in this chapter, which deals largely with problems of enrolment, the need to divide the school period into several sub-stages—pre-primary, primary (lower and higher) and secondary (lower and higher) has been recognised. But our general approach in the Report has been to regard the similarities between the problems of the different stages as being far more significant than the differences and to treat school education as a single whole.

7.02. Some general programmes of educational reconstruction which affect the school stage have already been considered in Part I of the Report. For instance, the problems relating to the structure of the educational system[1], the status and education of school teachers[2] and equalization of educational opportunities for school children through such measures as the abolition of tuition fees, free supply of books and materials and award of scholarships[3] have been discussed in the earlier chapters. In this and the next three chapters, we shall consider some important issues which are specifically concerned with the school stage only. The present chapter will take up all aspects of pre-primary education and the problems of expansion in primary and secondary education. Chapters VIII and IX will deal with the curriculum, textbooks, teaching and learning materials, methods of teaching and evaluation and educational guidance. In Chapter X, we shall examine in detail certain vital problems relating to supervision and administration.

PRE-PRIMARY EDUCATION

7.03. The objectives of pre-primary education may be stated as follows:

- to develop in the child good health habits and to build up basic skills necessary for personal adjustment, such as dressing, toilet habits, eating, washing, cleaning, etc.:
- to develop desirable social attitudes and manners; and to encourage healthy group participation, making the child sensitive to the rights and privileges of others;
- to develop emotional maturity by guiding the child to express, understand, accept and control his feelings and emotions;
- to encourage aesthetic appreciation;
- to stimulate the beginnings of intellectual curiousity concerning the environment and to help him understand the world in which he lives; and to foster new interest through opportunities to explore, investigate and experiment;
- to encourage independence and creativity by providing the child with sufficient opportunities for self-expression;
- to develop the child's ability to express his thoughts and feelings in fluent, correct and clear speech; and
- to develop in the child a good physique, adequate muscular coordination and basic motor skills.

7.04. **Importance of Pre-Primary Education.** Pre-primary schools were first established to meet social needs such as looking after the children of working mothers or providing a suitable environment to little boys and girls from urban families whose small tenements or flats were hardly appropriate for the children's proper growth. These schools also attempted to compensate for the unsatisfactory home environment of children from slum areas or poor families. Recently, however, the educational significance of this stage is being increasingly realised. Modern researches have shown that the years between three and ten are of the greatest importance in the child's physical, emotional and intellectual development. It has also been found that children who have been to a pre-primary school show better progress at the primary stage and help in reducing wastage and stagnation. The modern trend in educational policy, therefore, is to emphasize pre-primary education especially for children with unsatisfactory home backgrounds. This is the direction in which we also should move.

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[1] Chapter II.

[2] Chapters III and IV.

[3] Chapter VI.

7.05. **Recent Developments in Pre-Primary Education.** Prior to 1947, little attention was paid to pre-primary education and it was not even regarded as a State responsibility. For the first time in our educational history, the Report of the Central Advisory Board of Education on *Post-War Educational Development in India* (1944) emphasized its significance and recommended that an adequate provision of pre-primary education should be an essential adjunct of a national system of education. We are happy to note that pre-primary education has been rapidly gaining in popularity in the post-independence period. In 1950-51, the number of pre-primary schools was only 303 with 866 teachers and an enrolment of about 28,000. The total direct expenditure on pre-primary education was about 1.2 million or 0.1 per cent of the total educational expenditure. In 1965-66, the number of pre-primary schools increased to 3,500 with 6,500 teachers and a total enrolment of about 250,000. The total direct expenditure also rose up to Rs. 11 million or 0.2 per cent of the total educational expenditure.[1] These are mainly urban institutions. In rural areas excellent pioneering work has been done by the Central Social Welfare Board (CSWB) and the Community Development Administration which, taken together, run about 20,000 balwadis having a total enrolment of about 600,000. The progress is no doubt small in relation to our goals, but it marks a tremendous advance over earlier achievements.

7.06. **Recommendations.** While we recognize the need to develop pre-primary education as extensively as possible, our advance in this sector will necessarily be restricted on account of the inadequacy of the resources available, and especially because primary education must be accorded a higher priority. It is also necessary to reconcile the competing claims of quality and quantity. Some educationists are of the view that the pre-primary education to be provided must be of the proper quality, and they insist on maintaining standards which increase the cost per pupil to a level where any large-scale expansion becomes impossible. Others deliberately advocate the adoption of less costly techniques so that the benefit of pre-primary education may be extended to a larger proportion of children. There are also differences of opinion regarding the agency of development: some would prefer the responsibility for pre-primary education to be largely assumed by the State while others would leave it mainly to private enterprise. In these circumstances, we shall have to take a pragmatic view and adopt a policy which promotes experimentation and the best utilization and combination of existing resources and agencies.

7.07. We make the following recommendations for the development of pre-primary education during the next 20 years:

(1) There should be a State-level centre for the development of pre-primary education located in the State Institute of Education. In addition, a pre-primary education development centre should be established in each district in a phased programme spread over the next 20 years. The main functions of these centres would be to train pre-primary teachers, to provide supervision and guidance to pre-primary teachers working in the area, to hold refresher courses and in-service training programmes for them, to undertake the preparation of teaching aids out of the locally available materials, to conduct experimental pre-primary schools and to provide education to parents regarding child care. They can also advantageously undertake programmes of initial training of pre-primary teachers.[2]

(2) The establishment and conduct of pre-primary schools may be left, as at present, mainly to private enterprise. The State should assist through grants-in-aid on a basis of equalization. Accordingly, pre-primary schools catering to the needs of children from the under-privileged groups will have a higher claim on State funds.

(3) Every encouragement should be given to experimentation, particularly in devising less costly methods of expanding pre-primary education. We strongly commend the scheme recently adopted by the State of Madras. Under this programme, a local woman is selected as a teacher on a small honorarium, is given a short course of training, and is assisted in her work by the local Mahila Mandal. The outstanding features of the scheme are its low costs (the cost per child per year is less than Rs. 20) and its adaptability and suitability to rural areas. It works well and, under active teachers, child-

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[1] In addition to these officially reported institutions, there are a large number of unrecognised schools, especially in rural areas, in respect of which statistics are not available.

[2] For details see Supplementary Volume 1, Part V.

ren show better health, more mental alertness and a lively interest in the environment.[1]

(4) Another important experiment of this type, which has been tried with success in some parts of the country, is the establishment of children's play centres in close association with the primary schools. These are conducted by a specially trained teacher in the primary school, who is given an allowance for the purpose, or by a separate teacher. The programme, which lasts for about two hours a day, is simple and consists of group singing, story-telling and games, with considerable attention being given to personal hygiene and health. These centres serve as pre-school classes and smoothen the transition of the child from its play dominated world of infancy to the formal atmosphere of the primary school. They are comparatively less costly to run and serve a very useful purpose in reducing wastage and stagnation, particularly in Class I. Such centres should be attached to as many primary schools as possible.

(5) The role of the State should be to maintain such centres at the State and district levels, train pre-primary teachers, conduct research, assist in the preparation of materials and literature needed for pre-primary education and provide supervision and guidance to pre-primary schools and training institutions. As suggested above, it should assist private institutions at this stage through grants-in-aid: and in exceptional cases, it may also conduct some pre-primary schools to serve the needs of urban slums or rural areas or to serve as model institutions.

(6) We can hardly talk about a curriculum for pre-primary schools; it is more appropriate to think of it as a programme of activities. We agree with the suggestion of the Committee on Child Care (1961-62) appointed by the CSWB, that the programme should consist of the following activities:

(a) Play activities:

(i) Free play including educational and constructional toys, indoor games, and outdoor activities in association with other children;

(ii) Physical activities involving muscular and limb movement;

(iii) Play involving contact, acquaintance, imitation and experience of physical, family, and social environment;

(iv) Organized play, group activities and directional play;

(v) Playground activities using playground apparatus.

(b) Physical training including simple exercise, dance and eurhythmics.

(c) Manual activities and play like gardening, simple chores and participation in simple community efforts.

(d) Sensorial education using natural objects and specially constructed apparatus.

(e) Handwork and artistic activities involving the use of finger skills and tools; and activities like drawing, painting, singing, music and dancing.

(f) Learning activities including language; personal hygiene and health rules; elementary nature study involving contact with the physical, plant and animal world; counting and arithmetic, etc.

(g) Self-service in school eliminating as far as possible the use of servants and adult helpers.

We have often found that the programmes tend to be rigid and authoritarian, that adequate opportunities are not given to children to know their environment, that group work tends to be emphasized at the cost of the children's needs, and that the educational possibilities of the provision of mid-day meals and snacks are not utilised fully. To overcome these, it is necessary to improve the training of teachers and to give them greater freedom in planning their programmes.

(7) There is need for more coordination among the different agencies that work for child-care and pre-primary education, both at the national and at the State levels. In particular, it is necessary for the State Education Departments to develop close relations with the CSWB, the Indian Council of Child Welfare and the Community Development Administration.

(8) With regard to enrolments, we consider that a feasible target would be to enrol five per cent of the children in the age-group 3 to 5 by 1986. This will mean an enrolment of about 2.5 million. If the inexpensive techniques we have recommended above are adopted, this enrolment could be higher. We have also recommended the addition, on as wide a scale as possible, of a pre-school class to which children of the age 5-6 will be admitted. We anticipate that it may be possible to cover about 50 per cent of the children in this age-group by 1986. This will mean an enrolment of about 7.5 million. The total enrolment at this stage would thus be about 10 million.

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[1] For details see paper on the subject included in Supplementary Volume 1, Part V.

PRIMARY EDUCATION: FULFILMENT OF THE CONSTITUTIONAL DIRECTIVE

7.08. **Targets.** We shall now proceed to discuss another highly significant programme of educational reconstruction, namely, the fulfilment of the directive principle contained in Article 45 of the Constitution, that the State should strive to provide free and compulsory education for all children up to the age of 14 years. This was to have been achieved by 1960. But in view of the immense difficulties involved such as lack of adequate resources, tremendous increase in population, resistances to the education of girls, large numbers of children of the backward classes, general poverty of the people and the illiteracy and apathy of parents, it was not possible to make adequate progress in primary education, and the Constitutional Directive has remained unfulfilled. There has, therefore, been an insistent demand that Government should fix an early deadline for its fulfilment and prepare a concrete programme of action for the purpose. We are in sympathy with this demand and we believe that the provision of free and universal education for every child is an educational objective of the highest priority, not only on grounds of social justice and democracy, but also for raising the competence of the average worker and for increasing national productivity. In view, however, of the magnitude of the problem, the uneven development of primary education in the different parts of the country[1] and the large financial resources needed for the programme, we think that the best strategy for fulfilling the Constitutional Directive would be as follows:

(1) Each State, and even each district, should prepare a perspective plan for the development of primary education taking into account the stage of development already reached and the local conditions and problems. The objective of the plan should be to fulfil the Constitutional Directive as early as possible:

(2) Each State and district should be assisted to go ahead at the best pace it can, and the progress in no area should be allowed to be held up merely for want of essential facilities or financial allocations; and

(3) While the Constitutional Directive will be fulfilled in some places such as urban areas or advanced States as early as in 1975-76, *all* the areas in the country should be able to provide five years of good and effective education to *all* the children by 1975-76 and seven years of such education by 1985-86.

7.09. The targets proposed above may appear to be rather modest. But a closer examination will show that they are really formidable, and that the nation will have to strive its utmost to realise them. For instance, they involve a large increase in enrolments at this level—from 50 million in 1965-66 to 125 million in 1985-86. The enrolment at the lower primary stage or in Classes I-IV will rise from 37 million in 1965-66 to 72 million in 1975-76 and 76 million in 1985-86 and thus be doubled in a period of about 20 years. At the higher primary stage or in Classes V-VII, the enrolment will increase from 13 million in 1965-66 to 32 million in 1975-76 and 49 million in 1985-86, which is an increase of about four times in the same period.

7.10. But we would like to emphasize, not the increase in enrolment, but two other more significant and difficult aspects of these proposals. The first is the reduction of wastage and stagnation. At present, out of every 100 children who enter Class I, only about half complete Class IV and only 34 complete Class VII. The extent of stagnation is extremely large, particularly in Class I. We shall have to rectify this position and ensure that every child who enters Class I will progress regularly from year to year and reach Class V, and that not less than 80 per cent reach Class VII. Secondly, we must emphasize quality. It is generally agreed that the standard of education given in the primary schools is unsatisfactory and that it imparts little beyond literacy and some elementary knowledge in a few academic subjects. What is expected is that primary education should lay the foundation for a child to grow into a responsible and useful citizen of the country. The magnitude of the targets proposed above would be realized in its proper perspective if due weight is given to both these considerations.

7.11. A further point needs clarification: our proposal for making a seven-year course of primary education compulsory does not conflict with the Constitutional Directive of providing education to all children till they reach the age of 14 years. For various reasons, a large number of children reach the age of 14 even before they come to the end of Class VII. There is also no problem about those children who will complete Class VII earlier but proceed to secondary education. This leaves only those children (estimated to be about 10 per cent of the age group) who are not yet 14 at the end of Class VII and who wish to enter working life as early as possible. We consider that the needs of these children will be better served, not by lengthening the primary course by one year, but by the provision of short vocational courses of their choice. Such provision has been included in our estimates.

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[1] This has already been discussed under 'Regional Imbalances' in Chapter VI.

7.12. **The Programmes.** We have now to consider certain practical measures for the implementation of this programme of providing good general education of seven years' duration to every child. A careful study of the development of compulsory primary education in the advanced countries of the world shows that this programme is divided into three stages requiring:

—the provision of a school within easy distance from the home of every child;

-the enrolment of every child of the prescribed age into Class I of a school through propaganda, persuasion and even penal action, if necessary; and

— the retention of every enrolled child in school till he reaches the prescribed age or completes the prescribed course.

These are the three stages of universal provision, universal enrolment, and universal retention. They are not mutually exclusive and generally overlap and run into one another. Moreover, they presume the simultaneous implementation of a programme of qualitative improvement of education, because universal enrolment or retention depends very largely on the attracting and holding power of the schools. The progress of universal education in India can also be expected to follow this broad general pattern.

7.13. **Universal Provision of School Facilities.** The objective of universal provision of school facilities at the lower primary stage has almost been reached at the end of the third plan. In almost all States, villages with a population of 300 or over are provided with schools and, in several areas, even smaller villages have been given the facility. At the higher primary stage, however, the position is still far from satisfactory. Taking the country as a whole, there are about 78,000 such schools or about one higher primary school to about five lower primary schools, as against a desirable target of one to three. The situation varies greatly from State to State: while the target has already been reached in some States, the ratio of higher primary schools to lower primary schools is one to ten in several others.

7.14. The problems connected with planing and location of all schools—primary, secondary and vocational—will be discussed in a later section of this chapter. Briefly, it may be said that steps will have to be taken to bring a primary school within easy reach of every child. Lower primary schools including single-teacher schools, which are attended by younger children, will have to be set up within about a mile from the home of every child. A higher primary school needs at least three teachers and cannot therefore be set up on financial grounds in every small village. Such schools have to be shared by groups of small villages which, taken together, can provide a reasonable attendance. Moreover, as they are attended by older children, it is possible to plan them in such a way that every child will have a middle school within one to three miles of his residence. The first educational survey (1957) helped greatly in the planning of primary schools. It is now being revised: and we hope that the results of the revision will take this planning a step further.

7.15. **Universal Enrolment of Pupils.** A programme of increasing enrolment should be organized side by side with attempts to provide primary schools in the remotest parts of the country. Obviously, there are two main points at which fresh enrolments are made at this stage—Class I and Class V. The problems that arise at each of these points are very different and have to be examined separately.

7.16. **Enrolment in Class I.** The problem of enrolment in Class I (which may be called the initial cohort of the educational system) is of great significance. In all progressive countries, this initial cohort is homogeneous and consists mostly of children of the prescribed age for admission. In India, on the other hand, the initial cohort in Class I has always been extremely heterogeneous and its heterogeneity is being reduced only slowly. This will be clear from Table 7.1.

TABLE 7·1. AGE-COMPOSITION OF THE INITIAL COHORT IN INDIA (ENROLMENT IN CLASS I)

Age (in years)	1911-12		1950-51		1961-62	
	No. of children	% to total	No. of children	% to total	No. of children	% to total
Below 5	125,583	4·6	98,971	1·4	162,352	1·0
5—6	559,173	20·6	1,380,137	19·9	2,892,148	18·4
6—7	667,396	24·6	2,228,860	32·1	4,993,113	31·7
7—8	575,627	21·2	1,490,093	21·5	4,042,796	25·7
8—9	321,675	11·8	881,774	12·7	1,976,637	12·5
9—10	200,330	7·4	453,715	6·5	941,953	6·0
10—11	117,712	4·3	245,143	3·5	464,768	3·0
11—12	69,886	2·6	107,293	1·5	180,992	1·1
Above 12	79,669	2·9	62,379	0·9	91,405	0·6
Total enrolment in Class I . . .	2,717,051	100·0	6,948,365	100·0	15,746,164	100·0
Total estimated population of children in the age-group 6—7 . . .	6,639,582		9,310,800		12,384,000	
Percentage of children in the age-group 6—7 enrolled in Class I to total estimated population in the age-group 6—7		10·1		23·9		40·3

Source. Annual Educational Statistics published by the Ministry of Education.

In a good system, the children of the age 6-7, the prescribed age for admission, who are enrolled in school, should form the bulk of the total enrolment in Class I and should be about 95 to 97 per cent of the total population of children in the age-group. In 1961-62, the total enrolment in Class I was 15.7 million while the total population of children of the age 6-7 was only 12.4 million. And yet only 5 million children of this age (or 40.3 per cent of the total population of the age) were enrolled in Class I and formed only 31.7 per cent of the total enrolment in that class. The situation has no doubt improved over the past fifty years as the comparison of statistics for 1911-12 with those of 1961-62 will show. But the rate of change has been very slow because of the absence of a conscious and sustained effort to create a homogeneous cohort.

7.17. In advanced countries, parents are required to pre-register at least one year in advance the names of children who are to be admitted to school for the first time and only those children are enrolled in Class I who are within the prescribed age range. There is no system of pre-registration in India. A large number of parents, especially in rural areas, cannot even give the ages of their children correctly, and in many cases the teachers are required to guess them. Moreover, when enrolment drives are organized, the general trend is to enrol children of all ages into Class I. This heterogeneous character of the enrolment creates difficult pedagogic problems in the class besides increasing stagnation and wastage. We, therefore, recommend as follows:

(1) A system of pre-registration should be developed for all fresh admissions. The school teachers should take an annual census of all the children whose age is less than the prescribed admission age by one year and who would be seeking admission to the schools in the following year. Except in some big cities where the migratory population may be large, such census taking and pre-registration will be very useful and will not present any insuperable administrative problems. During the pre-registration year, an attempt should be made to provide children's play centres,

described earlier in paragraph 7.07 (4), in as many schools as possible.

(2) Fresh enrolments to Class I should, as far as possible, be restricted to children within the single year prescribed for admission. In the beginning, older children who have not yet been to school will have to be admitted to the class; but if intensive efforts are made every year to enrol all the children of the prescribed admission age, the number of over-age children seeking entry into Class I will diminish year by year and will disappear almost completely in a period of about 5-10 years.

7.18. **Enrolment in Class V.** At present, the rate of transfer of pupils from Class IV, which is the end of the lower primary stage, to Class V is about 85 per cent. This transfer rate should be raised to 90 per cent by the end of the fourth plan and to 100 per cent by the end of the fifth plan. It is necessary for this purpose to conduct surveys and investigations to find suitable measures to deal with the problem. From the evidence available at present, it appears that the drop-out at this stage is mainly due to such causes as the non-availability of a higher primary school in the neighbourhood; inadequate facilities for free education; economic need for the child to work in or for the family (especially in the case of girls); and reluctance of parents to educate their daughters further or to send them to mixed higher primary schools. The establishment of higher primary schools in villages of a certain size, as suggested earlier, and the provision of free primary education and also of part-time education at the higher primary stage will meet the first three of these difficulties. It will be possible to meet the last difficulty in some areas by opening separate schools for girls. In most cases, however, it can only be met by parental education and by persuading the parents to accept the inevitability of mixed schools for boys and girls.

7.19. **Universal Retention of Pupils.** Having enrolled every child in a school, it is essential to see that he progresses regularly from year to year (*i.e.*, there is no stagnation) and that he does not leave the school till he completes the prescribed age or class (*i.e.*, there is no wastage). As is well known, the extent of wastage and stagnation in our system is very large. The evil was first highlighted about forty years ago by the Hartog Committee; and although the issue has been discussed almost continuously since, very little effective action has been taken to reduce it. Precise studies of the problem spread over a time-series are not available. But Table 7.2, which gives the class-wise quinquennial enrolments since 1911-12, shows how persistent the problem has been and what little progress has been made in reducing its extent.

In a good system of school education, the distribution of pupils over the different classes should be fairly uniform, but it is not so in our country. It will be seen from Table 7.2 that:

- the total enrolments in Class I are proportionately very large. This is partly because of the large stagnation in this class and partly because about one-third to one-half of the total wastage at the primary stage occurs at the end of this class only;
- as against 100 children enrolled in Class I, there were only 20 in Class IV in 1911-12. In 1946-47, this proportion increased to 39. This shows some progress, though a slow one. In the post-independence period, however, the position has not only not improved but has deteriorated to some extent, because in 1965-66, there were only 37 students in Class IV as against 100 in Class I. The implication is obvious: the rapid expansion that has taken place has led to a slight increase in wastage and stagnation;
- as against 100 pupils in Class I, there were four pupils in Class VII in 1911-12. This proportion increased to 15 in 1946-47 and to 20 in 1965-66. There has been, therefore, a slow but steady progress in higher primary education throughout this period.

7.20. **Stagnation.** In order to have some idea of the extent of stagnation at the primary stage, from class to class, the Commission collected data regarding enrolments in Classes I-VIII in 29 districts out of 312. For each class, information was gathered on two points: total enrolment and number of repeaters, classified according to the total period they had spent in the class. From this information, the average period spent by the pupils in the class was calculated and its excess over one year—which is the normal period—was described as the 'stagnation index' for the class in that year. Table 7.3 gives the stagnation indices separately for boys and girls for each class in all the nine States studied.

TABLE 7·2. ENROLMENT IN CLASSES I—VIII (1911-12 To 1965-66)

Year	Class-wise Enrolment (in 000's)							
	I	II	III	IV	V	VI	VII	VIII
	1	2	3	4	5	6	7	8
1911-12	2,717* (100·0)	1,062 (39·1)	757 (27·9)	545 (20·1)	324 (11·9)	167 (6·1)	119 (4·4)	76 (2·8)
1916-17	2,933* (100·0)	1,404 (47·9)	934 (31·8)	667 (22·7)	415 (14·1)	215 (7·3)	157 (5·4)	105 (3·6)
1921-22	3,343 (100·0)	1,556 (46·5)	924 (27·6)	636 (19·0)	377 (11·3)	246 (7·4)	158 (4·7)	114 (3·4)
1926-27	5,280 (100·0)	1,638 (31·0)	1,131 (21·4)	768 (14·5)	427 (8·1)	279 (5·3)	211 (4·0)	141 (2·7)
1931-32	5,281 (100·0)	2,111 (40·0)	1,496 (28·3)	1,016 (19·2)	628 (11·9)	377 (7·1)	301 (5·7)	229 (4·3)
1936-37	5,291 (100·0)	2,378 (44·9)	1,762 (33·3)	1,288 (24·3)	790 (14·9)	477 (9·0)	365 (6·9)	296 (5·6)
1941-42	5,525 (100·0)	2,724 (49·3)	2,027 (36·7)	1,572 (28·5)	1,085 (19·6)	591 (10·7)	437 (7·9)	377 (6·8)
1946-47	3,570 (100·0)	2,525 (70·7)	1,821 (51·0)	1,404 (39·3)	1,137 (31·8)	648 (18·1)	523 (14·6)	448 (12·5)
1950-51	6,948 (100·0)	4,332 (62·3)	3,353 (48·3)	2,623 (37·8)	1,898 (27·3)	1,246 (17·9)	1,023 (14·7)	851 (12·2)
1955-56	9,958 (100·0)	5,523 (55·5)	4,067 (40·8)	3,216 (32·3)	2,403 (24·1)	1,698 (17·1)	1,436 (14·4)	1,160 (11·6)
1960-61	13,391 (100·0)	7,513 (56·1)	5,886 (44·0)	4,593 (34·3)	3,611 (27·0)	2,727 (20·4)	2,220 (16·6)	1,758 (13·1)
1965-66	18,843 (100·0)	10,973 (58·2)	8,875 (47·1)	6,924 (36·7)	5,522 (29·3)	4,453 (23·6)	3,680 (19·5)	2,900 (15·4)

*Includes enrolment in Infant A & B Classes.

Note. Figures within brackets indicate the percentage of enrolment in each class to the enrolment in Class I of the same year.

Source. Quinquennial reviews and reports of the Ministry of Education.

TABLE 7·3. STAGNATION INDICES FOR CLASSES I—VIII (1965)

State	Stagnation Index for Classes							
	I	II	III	IV	V	VI	VII	VIII
1. *Andhra Pradesh*								
Boys . . .	63·4	38·4	27·9	21·0	19·6	13·3	13·7	19·8
Girls . .	71·6	42·9	30·1	23·2	22·4	11·8	12·2	14·8
2. *Madhya Pradesh*								
Boys . . .	39·1	12·9	10·3	9·1	8·3	10·5	6·7	5·2
Girls . . .	34·7	13·8	11·3	10·3	8·3	3·4	4·0	4·3
3. *Maharashtra*								
Boys . . .	39·3	25·5	22·7	25·7	21·1	15·8	12·5	11·3
Girls . . .	52·5	35·8	33·3	38·5	23·5	17·2	12·6	7·6
4. *Rajasthan*								
Boys . . .	29·5	24·0	34·6	36·8	32·7	14·1	22·8	19·0
Girls . . .	23 7	23·7	44·2	[illegible]7·0	45·3	34·8	46·4	62·9
5. *Punjab*								
Boys . . .	24·6	13·3	10·2	6·6	7·1	13·4	12·4	9·2
Girls . . .	22·8	12·6	9·2	5·1	4·8	8·3	8·7	7·1
6. *Uttar Pradesh*								
Boys . . .	27·1	14·2	9·1	6·4	4·3	4·9	6·1	12·5
Girls . . .	18·5	14·3	11·5	9·4	9·1	12·7	10·7	25·5
7. *Mysore*								
Boys . . .	53·2	36·6	27·2	26·4	15·0	12·7	12·6	..
Girls . . .	66·1	39·9	27·1	19·0	12·4	13·1	15·6	..
8. *Kerala*								
Boys . . .	27·2	26·9	26·0	29·0	27·2	26·0	24·8	..
Girls . . .	26·3	26·0	24·6	27·1	26·6	23·1	25·7	..
9. *Orissa*								
Boys] . . .	43·1	33·3	33·7	30·0	15·4	9·2	21 5	12·3
Girls . . .	40·1	38·8	27·5	21·2	15·8	13·3	34·4	16·2
TOTAL								
Boys . . .	40·3	26·6	22·6	21·7	16·4	14·1	13·7	13·2
Girls . . .	47·1	33·1	26·6	25·6	19·8	17·3	17·9	16·4

Source. Data supplied by State Governments.

It will be seen from the preceding table that

- stagnation is highest in Class I;
- it is reduced considerably in Class II and then remains fairly constant in Classes III and IV;
- at the higher primary stage, stagnation decreases still further;
- on the whole, stagnation among girls is greater than among boys; and
- the extent of stagnation shows considerable variations from area to area.

7.21. **Wastage.** Recent and fairly large-scale studies in wastage are not available. But a study made by the Research Unit in the Directorate of Education, Maharashtra State, to follow the movement of pupils from class to class in the primary schools of Poona District showed that, if one begins with 1,000 students in Class I in a given year, as many as 414 of them leave school before completing Class IV. The following are the actual findings of the study:

(1) Left school in the first year of their school life in Class I . . .	144
Left school in the second year of their school life but still in Class I .	27
Left school in the third year of their school life but still in Class I .	12
Total left from Class I .	183
(2) Left school in the second year of their school life but after completing Class I and joining Class II . . .	67
Left school in the third year of their school life after completing Class I in two years and joining Class II .	8
Left school in the fourth year of their school life after completing Class I in three years and joining Class II .	5
Left school in the second year of their school life after failing in Class II .	25
Left school in the third year of their school life after failing in Class II .	13
Total left from Class II .	118
(3) Left school in the third year of their school life after passing Class II and joining Class III . . .	61
Left school in the fourth year of their school life after passing Class II and joining Class III . . .	18
Left school in the third year of their school life after failing in Class III .	9
Total left from Class III .	88
(4) Left school in the fourth year of their school life after passing Class III and joining Class IV . . .	25
Total left from Class IV .	25
Grand total of all students who left before completing Class IV .	414

7.22. Sad as this picture is, it is better than the situation in the country as a whole, mainly because the area where the study was conducted is fairly advanced educationally. A rough and ready method to measure the extent of wastage is to compare the diminution in enrolment from class to class over a series of years. Table 7.4 shows the extent of this diminution for the country as a whole in the post-independence period, separately for boys and girls and also separately for the lower primary and higher primary stages. The general picture it presents is even worse than that of the Poona Study. Wastage is very large at the lower primary stage—about 56 per cent for boys and 62 per cent for girls. About two-thirds of this wastage occurs in Class I. Moreover, it has remained fairly constant in the case of boys while showing a slight improvement in the case of girls. At the higher primary stage, wastage is much less—about 24 per cent for boys and 34 per cent for girls; and what is more important, it is decreasing consistently, although at a slow rate.

7.23. The foregoing discussion shows that the most important programme to be implemented at the primary stage during the next ten years is to improve the quality of education and to reduce stagnation and wastage to the minimum. In fact, the task of universal education *begins* when children are enrolled in Class I. It is *completed* only when they are successfully retained till they complete Class VII. In this overall programme, the reduction of wastage and stagnation in Class I is obviously the most important element.

7.24. **Stagnation and Wastage in Class I.** The large stagnation and wastage in Class I is due to a variety of causes which include:

- — the heterogeneity of the age-composition of students to which a reference has already been made;
- — the practice, which obtains in several States, of making fresh admissions throughout the year, instead of in the first month or so of the school year;
- — irregularity of attendance;
- — lack of educational equipment in the school as well as with the children;
- — over-crowded classes;
- — unsuitable curricula;
- — inability of the teachers to use playway techniques which can assist in initiating the children pleasantly to school life;
- — poor teaching of beginning reading;
- — inadequately prepared teachers; and
- — a wrong system of examinations.

7.25. The remedy for some of these defects is self-evident; and most of them could be eliminated through the development of qualitative programmes which are being discussed separately. In this connection, however, we would like to emphasize the following programmes:

(1) The examination at the end of Class I should be abolished and the

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1 *Indian Journal of Educational Administration and Research*, Autumn 1960, Vol. 1, No. 2, Ministry of Education Government of India, New Delhi.

TABLE 7·4. WASTAGE AT PRIMARY STAGE (1949-50 to 1961-62)

Classes I—IV (Lower Primary)

Year	Boys				Girls			
	I	II	III	IV	I	II	III	IV
1949-50	100	..	..	..	100	..	..	..
1950-51	100	65·1	..	..	100	57·4	..	..
1951-52	100	66·0	54·2	..	100	59·6	44·5	
1952-53	100	64·9	53·3	45·3	100	57·8	43·9	34·0
1953-54	100	65·8	54·8	46·8	100	58·7	45·6	35·2
1954-55	100	63·0	53·7	47·2	100	57·8	45·6	36·3
1955-56	100	61·8	52·7	46·7	100	58·2	45·4	36·7
1956-57	100	60·8	50·9	45·9	100	55·3	44·6	36·5
1957-58	100	61·4	50·0	42·9	100	55·0	43·0	35·2
1958-59	100	62·1	51·8	43·1	100	58·2	43·9	34·9
1959-60	..	61·2	51·2	44·3	..	56·4	45·8	35·5
1960-61	..	..	51·1	44·4	..	..	45·1	37·6
1961-62	..	..	..	44·4	..	..	..	37·5

Classes V—VII (Higher Primary)

Year	Boys			Girls		
	V	VI	VII	V	VI	VII
1949-50	100	..	..	100	..	..
1950-51	100	75·5	..	100	59·4	..
1951-52	100	77·5	68·5	100	60·7	49·5
1952-53	100	75·8	65·0	100	60·3	49·4
1953-54	100	74·8	65·6	100	60·3	53·1
1954-55	100	73·7	67·0	100	63·4	51·6
1955-56	100	76·4	66·8	100	65·7	55·3
1956-57	100	79·1	69·4	100	72·4	59·9
1957-58	100	77·7	69·5	100	69·0	61·8
1958-59	100	83·2	70·5	100	72·9	61·0
1959-60	100	85·9	73·3	100	81·7	61·5
1960-61	..	84·3	74·2	..	74·8	68·1
1961-62	..	..	75·6	..	..	66·2

Source. Form A of the Ministry of Education.

first two classes (and wherever possible, even the first three or four) should be regarded as one teaching unit, within which each child can progress according to his own pace.

(2) The introduction, as recommended earlier, of a year of pre-school education of an economical type.

(3) The adoption of play-way techniques in Class I for introducing the child to school life in a pleasant way. For this purpose, methods of instruction in Class I should be patterned in the light of the techniques utilised at the pre-primary stage and the teachers in charge of this class should be trained or oriented accordingly.

7.26. **Stagnation and Wastage in other Classes.** The extent of stagnation and wastage in other classes of the primary stage is comparatively small. Its causes may be broadly divided into three categories—economic, educational and social. A closer analysis of these causes will also show the remedies.

7.27. **Economic Causes.** The few studies conducted on the subject have shown that about 65 per cent of the wastage is due to poverty. A child is willingly sent to school between the ages of 6 and 9 because at this stage he is more a nuisance at home than a help. After the age of 9 or 10, the child becomes an economic asset because he can work at home or earn something outside. This is especially true of girls who have to assist the over-worked mother at home. The child is, therefore, withdrawn from the school and thus becomes a 'wastage' case. The long-term solution to this problem can only come through general economic improvement. But in the immediate situation, the only way to overcome this difficulty is to provide part-time education so that children can work as well as learn.

7.28. **Literacy Classes.** From this point of view, we suggest two programmes. The object of the first is to prevent additions to the ranks of illiterates. At present, such additions are being continuously made on a large scale for several reasons. A proportion of children do not get enrolled in schools. Even among those who are enrolled, a large number drop out before completing Class IV or V and attaining permanent functional literacy; and some even relapse into illiteracy a little later. To prevent such additions and to help in reducing illiteracy, **we recommend that all children in the age-group 11-14, who are not attending schools and who have not completed the primary stage of education and become functionally literate, should be required to attend 'literacy classes' for a period of one year at least.**

7.29. Experiments conducted by some institutions in the country have shown that if we begin with grown-up children of this age-group and provide them with part-time education (of about one and a half to two hours per day for about three days a week), it is possible to make them functionally literate in the course of one year. Such classes can be conveniently organized by teachers in primary schools outside the regular school hours, utilising the buildings and equipment of the same schools. The timings of the classes would have to be elastic; they should be determined by local conditions and the needs of the children attending in the sense that attendance in such classes should not interfere with the work they do for the families. In most cases, they will be organized on a part-time basis for about one and a half hours per day, either in the morning or in the evening. For girls, some time in the afternoon is always more convenient. The teachers should be adequately remunerated for the purpose. There need be no separate curricula; but as the size of the average class will be small, it may be possible for teachers to give individual attention to each child and to make them functionally literate during this period. The cost of running these classes will be comparatively small, not more than about Rs. 40 per child per year, but its results will be very substantial.

7.30. There is hardly any reason to doubt the success of the programme, and it can even be adopted on a nation-wide scale forthwith. But if it is considered necessary, a few pilot projects may be tried in each district for a short time in order to gain experience before the scheme is launched on a nation-wide basis. In any given area, it may be desirable to begin these classes on a voluntary basis in the first instance. **Attendance at such classes should be made obligatory only after the local community becomes familiar with the concept and begins to appreciate it.**

7.31. It is important to realise that the total size of this problem is comparatively small and that it is of a vanishing character. At present, the population of children in the age-group 11-13 is about 34 million. Of these, 11 million are attending schools in Classes VI-VII; and about 3 million are expected to have completed the primary stage although they are not attending at present.

This leaves 20 million children in the age-group 11-13 who will come under this compulsory programme in 1966. During the next ten years, two things are likely to happen. First, the number of children attending schools in Classes V-VII will continue to increase much faster than the growth of population. Secondly, as effective education of five years is increasingly provided to children, the number of those children who leave school before attaining functional literacy will lessen year by year and will disappear by 1976.

7.32. **Part-time Education at the Higher Primary Stage.** (1) The second programme to offset wastage is to provide part-time education to children who have completed the lower primary stage, and who desire to study further but cannot for economic reasons afford to do so on a full-time basis. The number of such children is large even at present; and it will increase as education reaches the still poorer sections of society. The only way in which these children can receive education is by getting it on a part-time basis; and it should be a deliberate object of policy to provide such education on as large a scale as possible.

(2) The content of this part-time education would have to be elastic and should be determined according to the needs and aptitudes of the children receiving it. For some children who desire to complete this stage of education and prepare themselves for the next, it should be patterned on the lines of the full-time courses. But for those who do not wish to do so—and these would be the large majority—the content of education should have a large vocational element and should be so developed as to serve their immediate needs.

(3) To begin with, attendance at these classes should be voluntary. But obligatory attendance may be introduced in an area as soon as the ground is ready. This may be done in some areas almost immediately, and all parts of the country should be covered in the fifth and sixth plans.

(4) It is not possible to determine precisely the proportion of students who will be in part-time education at this stage. The policy adopted should be to provide a place in full-time education for every student who desires to receive such education and to provide a place in part-time education for all those who cannot, for some reason, follow a full-time course. The proportion of students in part-time and full-time education would thus vary, depending upon economic factors, from area to area, and even in the same area, from one class of society to another. For purposes of financial estimates, however, we have assumed that, for the country as a whole, enrolment in part-time education would be about 10 per cent of the total enrolment at this stage in 1975-76 and about 20 per cent in 1985-86.

7.33. **Educational and Social Causes.** The educational factors which are responsible for another 30 per cent of the wastage include the existence of incomplete schools which do not teach the full courses; the large prevalence of stagnation which discourages children from staying longer at school; the dull character of most of the schools and their poor capacity to attract students and retain them; the absence of ancillary services like school meals and school health; and the failure of the average parent or child to see the advantage of attendance at school. It need hardly be stressed that the sovereign remedy for all these problems is qualitative improvement supplemented by an intensive programme of parental education. The social factors which operate mainly in the case of girls play a minor role. They include betrothal or marriage and opposition to sending grown-up girls to schools, especially to mixed schools or schools without women teachers. The remedies are self-evident.

7.34. **General Observations.** An effective way in which to reduce the evils of wastage and stagnation is for the State Education Department to treat *every* school as an individual entity and for every school to give individual attention to *every* child. The Department should use the techniques which have been developed to measure the extent of wastage and stagnation from year to year in each class and in each school: and, on the basis of these data, it should insist on every school making the best efforts possible to reduce these evils. Similarly, each school should pay adequate attention to individual children. It has been found that wastage is reduced even by a simple act such as a sympathetic enquiry made by a teacher of the parents whenever a child ceases to attend school. What is needed, therefore, is a nation-wide programme of school improvement in which the reduction of wastage and stagnation would figure prominently. The broad outline of such a programme is discussed more fully elsewhere.[1]

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[1] Chapter X.

7.35. It has to be remembered that wastage and stagnation, like headache and fever, are not diseases in themselves: they are really symptoms of other diseases in the educational system, the chief among which are the lack of proper articulation between education and life and the poor capacity of the schools to attract and hold students. To these may be added a third ailment—poverty, which falls outside the system. Urgent action is needed to remove the first two educational weaknesses; the effect of the third can be offset only as the economy of the country improves. The goal of universal retention of pupils, therefore, is the most difficult of all and can be reached only over a period of time. This makes it all the more necessary to organize immediately an intensive programme for the reduction of wastage and to pursue it till the goal is reached. A beginning should be made with Class I, where the target should be to reduce the wastage by half before the end of the fourth plan and to reduce it to the minimum by the end of the fifth plan. In the lower primary stage, all wastage should be reduced to the absolute minimum by the end of the first decade (1966-76) and at the higher primary stage, by the end of the second decade (1976-87).

ENROLMENTS AT THE PRIMARY STAGE

7.36. **Targets.** Table 7.5 gives the enrolments at the primary stage in the first three plans as well as the anticipated enrolments during the next twenty years if the Constitutional Directive is to be fulfilled. (See also charts on pages 162 and 163).

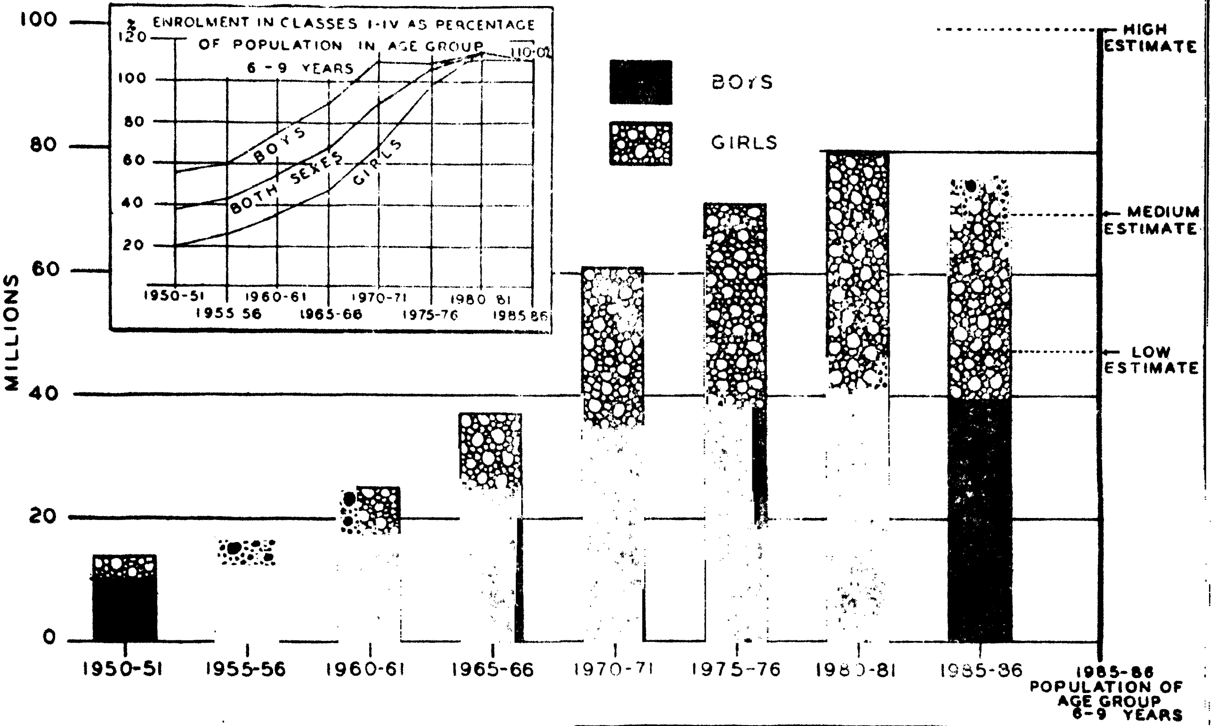
TABLE 7·5. ENROLMENTS IN PRIMARY EDUCATION

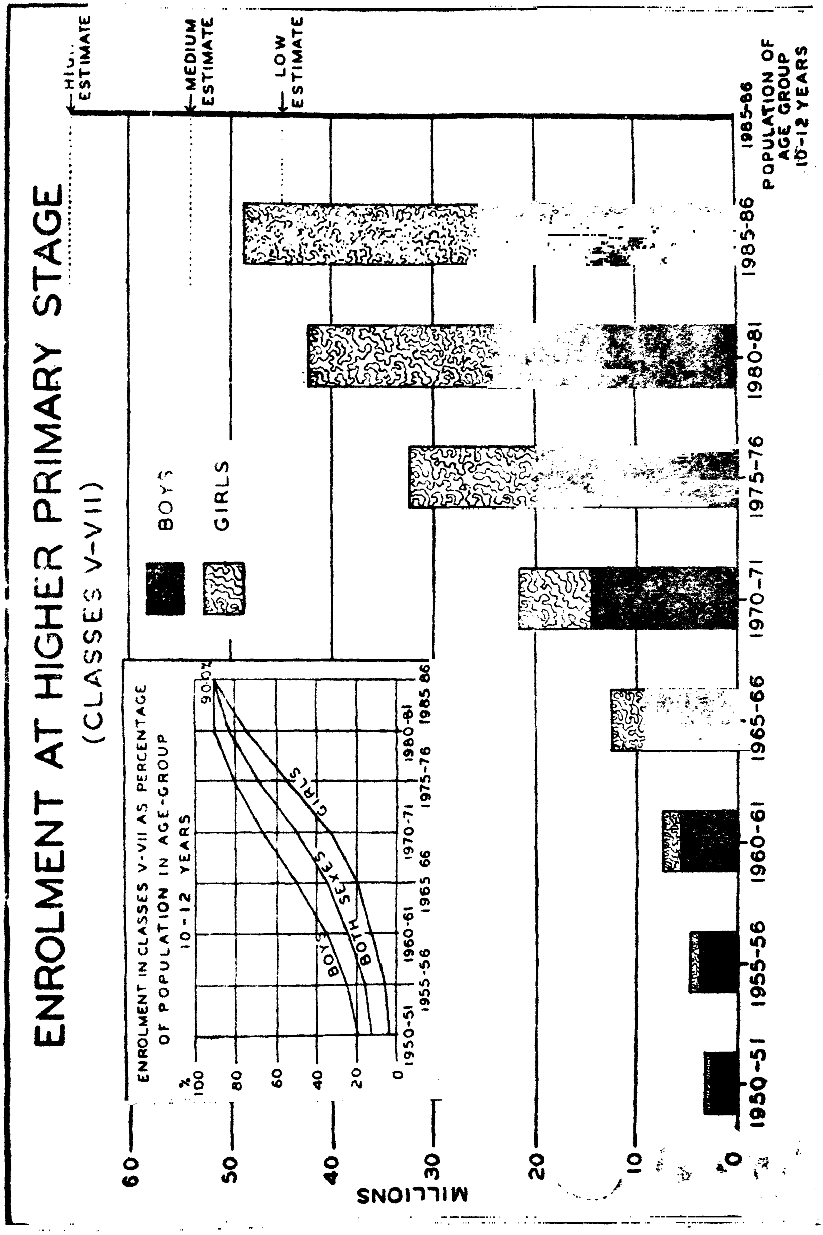
Stage/Years	Enrolment (in 000's)			Enrolment as Percentage of Population in the Corresponding Age-groups		
	Boys	Girls	Total	Boys	Girls	Total
I—IV						
1950-51	10,102 (4·1)	3,549 (7·2)	13,651 (4·9)	55·0	20·1	37·8
1955-56	12,369 (6·8)	5,011 (9·3)	17,380 (7·5)	59·5	25·0	42·6
1960-61	17,170 (14·3)	7,826 (9·9)	24,996 (8·2)	74·0	35·0	54·8
1965-66	24,536 (7·0)	12,554 (10·2)	37,090 (8·1)	90·2	47·6	69·2
1970-71	34,447 (2·0)	26,850 (10·4)	61,297 (5·5)	109·8	68·6	89·7
1975-76	38,066 (1·6)	33,484 (2·8)	71,550 (2·2)	109·7	97·2	106·4
1980-81	41,173	38,515	79,688	110·8	110·7	110·8
1985-86	39,509	36,730	76,239	110·0	110·0	110·0
V—VII						
1950-51	2,669 (6·5)	559 (10·8)	3,228 (7·6)	20·8	4·6	13·0
1955-56	3,659 (8·8)	933 (15·0)	4,592 (10·2)	25·6	6·9	16·5
1960-61	5,587 (9·9)	1,876 (13·8)	7,463 (11·0)	35·5	12·5	24·3
1965-66	8,962 (10·0)	3,587 (13·6)	12,549 (11·1)	49·9	20·7	35·6
1970-71	14,433 (6·5)	6,785 (13·2)	21,218 (8·8)	67·7	33·0	50·7
1975-76	19,774 (3·8)	12,620 (7·9)	32,394 (5·5)	81·9	55·7	69·2
1980-81	23,867 (1·1)	18,456 (5·0)	42,323 (2·9)	90·0	74·0	82·3
1985-86	25,214	23,500	48,714	90·0	90·0	90·0

N.B. For details see Supplementary Volume I, Part V.
Figures in brackets indicate rate of annual growth.

ENROLMENT AT LOWER PRIMARY STAGE

(CLASSES I-IV)





ENROLMENT AT HIGHER PRIMARY STAGE

(CLASSES V–VIII)

It will be seen from this table that expansion at the lower primary stage has been very rapid in the first three plans. The total enrolments increased from 14 million in 1950-51 to 37 million in 1965-66—nearly a three-fold increase in 15 years. This implies an average annual growth of 4.9 per cent in the first plan, 7.5 per cent in the second and 8.2 per cent in the third. We expect the same tempo to continue in the fourth plan. In the next ten years, as we near the saturation point, the tempo of expansion will slow down considerably—to 5.5 per cent per year in the fifth plan and 2.2 per cent in the sixth. The total enrolments are expected to increase from 37 million in 1965-66 to 54 million in 1970-71, to 72 million in 1975-76 and to 80 million in 1980-81. In the next plan, the enrolments will actually decline to 76 million—on account of the anticipated effect of the fall in the birth-rate—and this decline will continue for a few years. In other words, we would have crossed the hump by 1981. Thereafter the progress would be easier and, as the pressures of expansion would diminish, it will be possible to pay still greater attention to qualitative improvement.

7.37. At the higher primary stage, the picture is slightly different. Here the expansion in the first three plans has been even more rapid than at the lower primary stage, the total enrolments increasing from 3 million in 1950-51 to 13 million in 1965-66—about a four-fold increase in 15 years. Here also, the tempo of expansion has been rising from plan to plan, the average annual rate of growth being 7.6 per cent in the first plan, 10.2 per cent in the second and 11.0 per cent in the third. In the next twenty years, the total expansion will be about three and a half times and the enrolments will rise from 13 million in 1965-66 to 32 million in 1975-76 and to 49 million in 1985-86. Up to 1976, expansion will be a little easier; but thereafter, as we approach the saturation point, the difficulties will increase considerably. Fortunately, the expansion programme at the lower primary stage will have substantially ended by then and it will be possible to concentrate resources to a greater extent on the development of the higher primary stage.

7.38. **Education of Girls.** Two problems concerning expansion—the education of girls and of tribals—deserve special notice. It will be seen from Table 7.5, that at the lower primary stage, the problem with regard to boys is very near solution, because their enrolment is about 90 per cent of the population in the corresponding age-group. But the enrolment of girls is much lower—the number of girls enrolled for every 100 boys being only 50. At the higher primary stage, the gap between the education of boys and that of girls becomes wider still—although both have still a long way to go—and the number of girls enrolled for every 100 boys is only 40. In fact, it may well be said that the problem of fulfilling the Constitutional Directive is essentially the problem of educating girls. This problem was carefully examined by the National Committee on Women's Education (1958-59) with whose recommendations we fully agree. In particular, we would like to emphasize its proposals regarding

- — educating public opinion to overcome traditional prejudices against girls' education;
- — appointing women teachers;
- — popularising mixed primary schools; and wherever possible and demanded, opening separate schools for girls at the higher primary stage;
- — providing free books and writing materials and, where needed, even clothing; and
- — providing part-time education for girls in the age-group 11-13 who cannot attend schools on a whole-time basis because they are required to work at home.

7.39. **Education of the Tribals.** The problem of spreading education among the tribals also needs special attention. Here the main difficulty is that of getting teachers for the purpose. The obvious remedy seems to lie in providing better scales of pay and adequate housing facilities for those who are prepared to take up the task of teaching in tribal areas. The teachers must know the tribal language and culture, and a study of these should be included in their training programmes. The programme of the school will have to be redesigned to suit tribal life. In thinly populated areas, where it is not possible to establish day schools, Ashram Schools should be established in large numbers.

7.40. **Special Assistance to Underdeveloped Areas.** As pointed out earlier, the development of primary education shows considerable variation from area to area. The magnitude of the unfinished task, therefore, is very unequally distributed between the different areas. The capacities of the different parts of the country to support a programme of universal primary education are also unequal and what is worse, it is the poorer areas that often have the heaviest load of the unfinished task to carry. Under these circumstances the equalization of educational opportunities assumes great significance.

7.41. A process of equalizing opportunities in primary education has to be attempted at various levels. When the family is responsible for the primary education of children, inequalities develop between children from the rich and those from the poor families. These can be equalized at the local government level which can strive to reduce the inequalities at the family level. It will, therefore, be a responsibility of the district school boards[1] to try to equalize opportunities for primary education between different villages and towns within their areas and between families in each town and village. But the economic capacities of districts and their loads of the unfinished task are very uneven. It is, therefore, a responsibility of the State Governments to strive to equalize opportunities as between districts through a grant-in-aid based on the principle of equalization[1]. Finally, similar inequalities appear again at the State level in the development of primary education already achieved, in the magnitude of the unfinished task and in the economic capacity of the States to support a programme of universal education. It is, therefore, the responsibility of the Government of India to strive to equalize opportunities in primary education at the State level. This may be done through the institution of a special grant-in-aid in the Centrally-sponsored sector to assist the poorer and less developed States to fulfil the Constitutional Directive in time.

7.42. **Enrichment of the Curricula and Improvement of Quality**. Expansion of facilities at the primary stage and the universal enrolment of children and their retention in school till the end of the compulsory period is only one aspect of the fulfilment of the Constitutional Directive. An equally important aspect is qualitative improvement so that the instruction imparted becomes good education and helps children to grow into useful and responsible citizens. The most crucial programme from this point of view is the improvement in the quality of primary teachers, which has already been discussed elsewhere[2]. Another equally significant programme is the introduction of work-experience as an integral part of primary education. Besides this, the teaching of science and mathematics has to be vitalized, the entire curriculum has to be overhauled and improved, and modern methods of teaching and evaluation have to be adopted. These programmes are discussed in the next two chapters.

EXPANSION OF SECONDARY EDUCATION

(Classes VIII—XII)

7.43. **General Principles**. We shall now consider the problems of expansion at the secondary stage relating to the establishment of secondary schools and to the planning of their enrolments. In both these matters, the policies to be adopted are different from those in primary education.

(1) *Establishment of Secondary Schools.* It is a major objective of educational policy to take the primary school as close to the home of the child as possible, even if this implies the establishment of smaller and costlier institutions. At the secondary stage, on the other hand, distance is a less overriding consideration, and emphasis must shift to the establishment of optimum-sized institutions which tend to be more economical and efficient. This is discussed more fully in a later section.

(2) *Enrolments in Secondary Education.* Similarly, for several years to come it will not be financially possible for the States to make secondary education universal, nor will it be possible on economic grounds for the large majority of children to continue their education beyond the compulsory stage. The objective of the enrolment policy in secondary education will, therefore, have to be defined on a different basis. In this connection, we invite attention to

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[1] The detailes of this proposal have been discussed in Chapters X and XVIII.

[2] See Chapters III and IV.

our recommendations made elsewhere[1] that

- the overall enrolments in secondary education should be broadly governed by the need for trained manpower;
- it is essential to vocationalize secondary education and to work towards a target wherein about 20 per cent of the enrolments at the lower secondary stage and about 50 per cent of those at the higher secondary stage would be in vocational education;
- there should be an emphasis on equalization of opportunities in secondary education and, from this point of view, a large programme of scholarships should be developed at this stage; efforts are also needed to reduce the large imbalances now seen in the expansion of secondary education in the different parts of the country and to spread secondary education among girls, the scheduled castes and the scheduled tribes;
- in identifying the children to be assisted in studying further at the secondary stage, 'ability' should not be understood in the narrow traditional sense to mean merely intellectual competence, but the concept should be broadened to include all types of abilities; and
- earnest efforts should be made to identify and develop talent.

7.44. **Enrolments in Secondary Education.** In the light of these broad principles, we shall now discuss the enrolments at the lower secondary and higher secondary stages. These have been reproduced in Table 7.6 on the next page. It will be seen therefrom that at the lower secondary stage, the total enrolments were nearly quadrupled and increased from 1.5 million in 1950-51 to 6.1 million in 1965-66. This implies an average annual increase of about 10 per cent or a doubling period of about seven years. In the next 20 years, the enrolments will again be quadrupled and rise from 6.1 million to 24.4 million. But this implies an average annual increase of about 7 per cent only or a doubling period of ten years. The increase in enrolments in absolute numbers during the next two decades is very large—about four times that in the first three plans—but the annual rate of growth is slowed down from 10 to 7 per cent. (See also chart on page 168).

The position is similar at the higher secondary stage also. The enrolments have risen from about 282,000 in 1950-51 to 1.4 million in 1965-66—an increase by five times. This implies an average annual rate of growth of 11.3 per cent or a doubling period of about six years. In the next 20 years, the enrolments will again increase by five times and rise from 1.4 million to 6.9 million. The increase is absolute numbers is thus about five times that which occurred in the first three plans. But the average annual growth is slowed down from 11.3 per cent to 8.3 per cent and the doubling period is now about nine years.

It will also be observed that the increase at the higher secondary stage is comparatively slower between 1965 and 1975. But it becomes more rapid in the succeeding decades because of the addition of one year to this stage.[2] (See also chart on page 169).

7.45. In planning enrolments in secondary education in the next two decades, two factors will have to be kept in view:

- The pressures of expansion will increase rather than decrease because of such factors as the establishment of high schools in rural areas hitherto unserved, the improvement in the general economic condition of the people, and the spread of the desire for post-elementary education to all sections of society; and
- even at the present rates of expansion, standards have deteriorated because enrolments have outstripped available facilities like teachers or equipment. Besides, there has been a large increase in unemployment amongst the matriculates. If the present trends continue or are allowed to increase, this deterioration in standards will be accentuated and educated unemployment will be extremely serious.

7.46. It is, therefore, necessary to regulate enrolments as proposed above. This implies the adoption of a policy of (1) locating

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[1] Chapter V.

[2] See Chapter II for details.

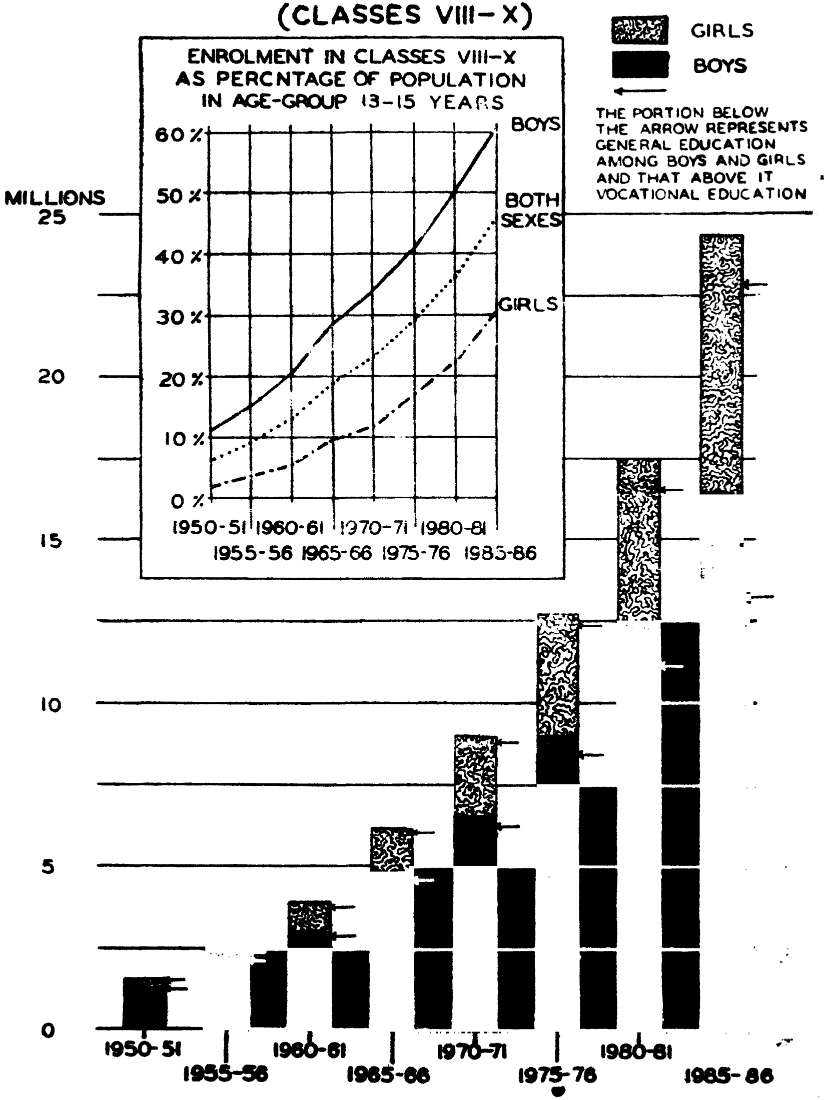
TABLE 7·6. ENROLMENTS IN SECONDARY EDUCATION

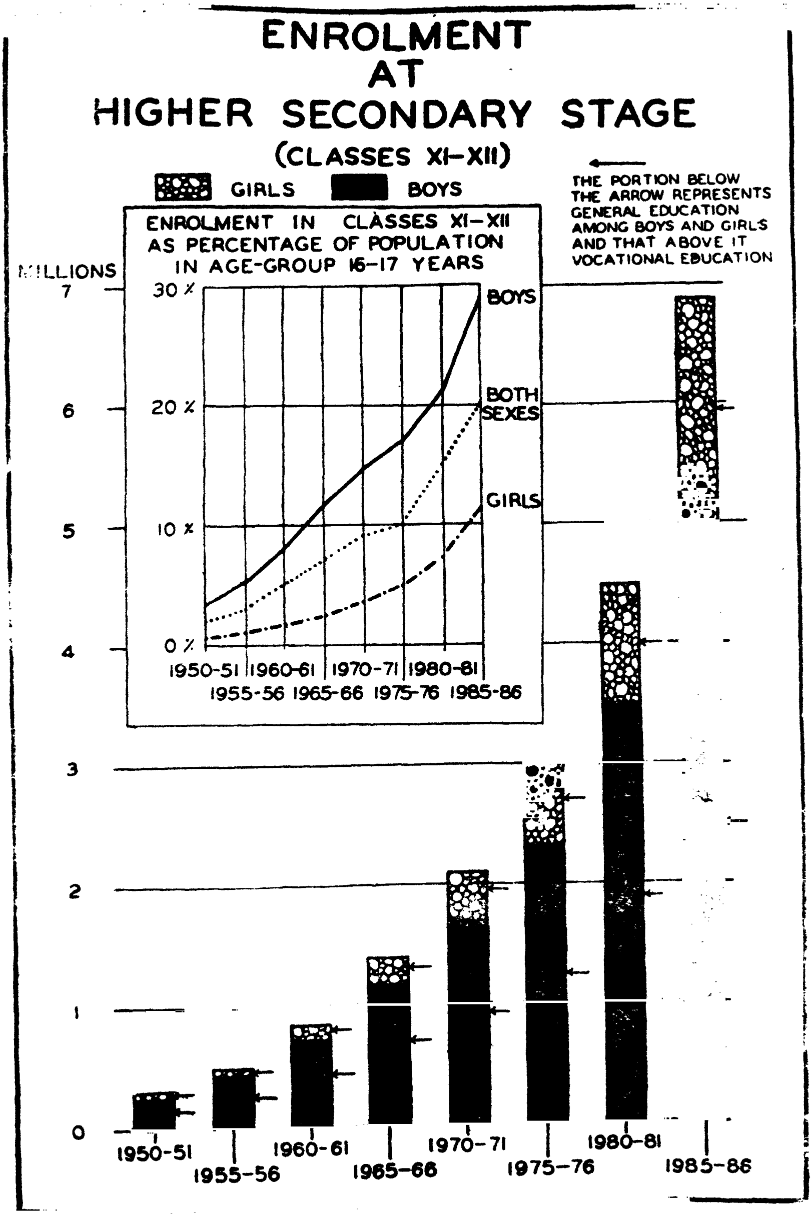
Stage/Years	Enrolment (000's)			Enrolment as Percentage of Population in the Corresponding Age-groups		
	Boys	Girls	Total	Boys	Girls	**Total**
Classes VIII—X						
1950-51	1.304 (8·5)	204 (14·8)	1.508 (9·5)	10·9	1·8	**6·5**
1955-56	1.965 (8·1)	406 (12·8)	2.371 (9·2)	14·9	3·3	**9·3**
1960-61	2.941 (9·9)	741 (13·9)	3,682 (10·7)	20·4	5·4	**13·1**
1965-66	4.707 (6·9)	1.420 (9·7)	6 127 (7·5)	28·7	9·1	**19·1**
1970-71	6.559 (6·8)	2.259 (9·7)	8.818 (7·5)	34·2	12·2	**23·4**
1975-76	9.104 (6·2)	3.581 (8·2)	12,685 (6·8)	40·8	16·9	**29·1**
1980-81	12,256 (6·1)	5.285 (8·1)	17 541 (6·7)	49·1	22·6	**36·3**
1985-86	16,526	7.842	24 368	60·4	30·6	**46·0**
Classes XI—XII						
1950-51	245 (12·0)	37 (13·9)	282 (12·2)	3·3	0·5	**1·9**
1955-56	431 (10·7)	71 (13·2)	502 (11·1)	5·2	0·9	**3·1**
1960-61	717 (10·3)	132 (11·4)	849 (10·5)	8·0	1·6	**4·9**
1965-66	1.172 (7·7)	226 (11·6)	1.398 (8·3)	11·5	2·3	**7·0**
1970-71	1.696 (6·7)	391 (10·3)	2,087 (7·5)	14·6	3·5	**9·2**
1975-76	2.351 (7·8)	638 (11·3)	2.989 (8·6)	17·[illegible]	4·8	**11·0**
1980-81	3,423 (7·9)	1.089 (11·4)	4,512 (8·8)	21·7	7·4	**14·8**
1985-86	5,004	1,869	6.873	28·8	11·4	**20·4**

Source. Ministry of Education. Form A, for 1950-51 to 1960-61. Data for 1965-66 were estimated in the Secretariat of the Commission.

N.B. Figures in parentheses show the average annual rate of growth during the quinquennium concerned.

ENROLMENT AT LOWER SECONDARY STAGE (CLASSES VIII–X)




ENROLMENT
AT
HIGHER SECONDARY STAGE
(CLASSES XI–XII)
GIRLS
BOYS
THE PORTION BELOW THE ARROW REPRESENTS GENERAL EDUCATION AMONG BOYS AND GIRLS AND THAT ABOVE IT VOCATIONAL EDUCATION
MILLIONS
7
6
5
4
3
2
1
0
1950-51
1955-56
1960-61
1965-66
1970-71
1975-76
1980-81
1985-86
ENROLMENT IN CLASSES XI–XII AS PERCENTAGE OF POPULATION IN AGE-GROUP 16–17 YEARS
30 %
20 %
10 %
0 %
BOYS
BOTH SEXES
GIRLS
1950-51
1960-61
1970-71
1980-81
1955-56
1965-66
1975-76
1985-86

secondary schools in a well-planned manner, (2) maintaining adequate standards and determining the enrolments and intake of each secondary school with reference to places available, and (3) selecting the best amongst the applicants for the places available. To give effect to these new policies, we make the following recommendations:

(1) A development plan for secondary education should be prepared separately for each district, after taking into consideration the existing and perspective needs of expansion. The plan should indicate the measures required to be taken, with rough estimates of cost, for raising each secondary school to an optimum level of efficiency, the places where new schools are needed, and the manner in which the location of existing schools can be rationalized by a process of consolidation in areas where schools have already proliferated and are creating problems of overlap, duplication or unhealthy educational competition. The preparation of such a plan should be undertaken and completed immediately, and its implementation should start as soon as practicable and be completed in a period of about ten years. Each school should be given notice to develop itself on the lines indicated within a given time; and the necessary financial assistance should be made available to it by a suitable amendment of the grant-in-aid rules, if necessary. A large majority of the schools, it is hoped, will rise to the occasion and improve themselves. Until they do so, however, their recognition should be extended temporarily and there should be a detailed inspection to assess the progress made before the recognition is renewed. If a school cannot come up to the standards in spite of all these efforts, there should be no hesitation in withdrawing its recognition.

(2) All secondary schools should be adequately staffed and equipped to provide good education. For this purpose, it is necessary to ensure that the essential standards are maintained in all new institutions and to resist the trend, now often noticed, to establish secondary schools without the needed teachers or facilities. Steps should also be taken to see that the existing institutions are raised gradually to at least the minimum levels prescribed and that over-crowding in classes is not permitted. If these measures are adopted, it will be possible to determine the places available in lower secondary schools and the quality of education imparted therein.

(3) Each secondary school should select the best students for admission from amongst the applicants. As stated earlier[1], the selection at the lower secondary stage will be in the nature of a 'self-selection'. At the higher secondary stage, however, the selection will have to be more rigorous. The principal basis for such selection would nomally be the marks obtained in the public examination at the end of Class X. But the unreliability of this basis, especially in borderline cases, should be tempered by taking into consideration the school record, the proficiency of the students in fields not tested in the examination and such other relevant factors. It should also be possible to make an exception in the case of very gifted students in some special fields, *e.g.*, mathematics or languages, who may not have shown good performance in the aggregate. By and large, the methods of selection adopted here will be similar to those which will be adopted at the university stage[2].

The chart on page 171 gives a graphic representation of the enrolment at the four main stages of school education from 1950-51 to 1985-86.

7.47. **Vocational Education.** We shall now discuss some important features of the expansion of secondary education. The most important of these is vocationalization which we have repeatedly stressed in this report. As we visualize them, the enrolments in vocational education at the secondary stage will be as shown in Table 7.7.

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[1] Chapter V.

[2] For details, see Chapter XII.

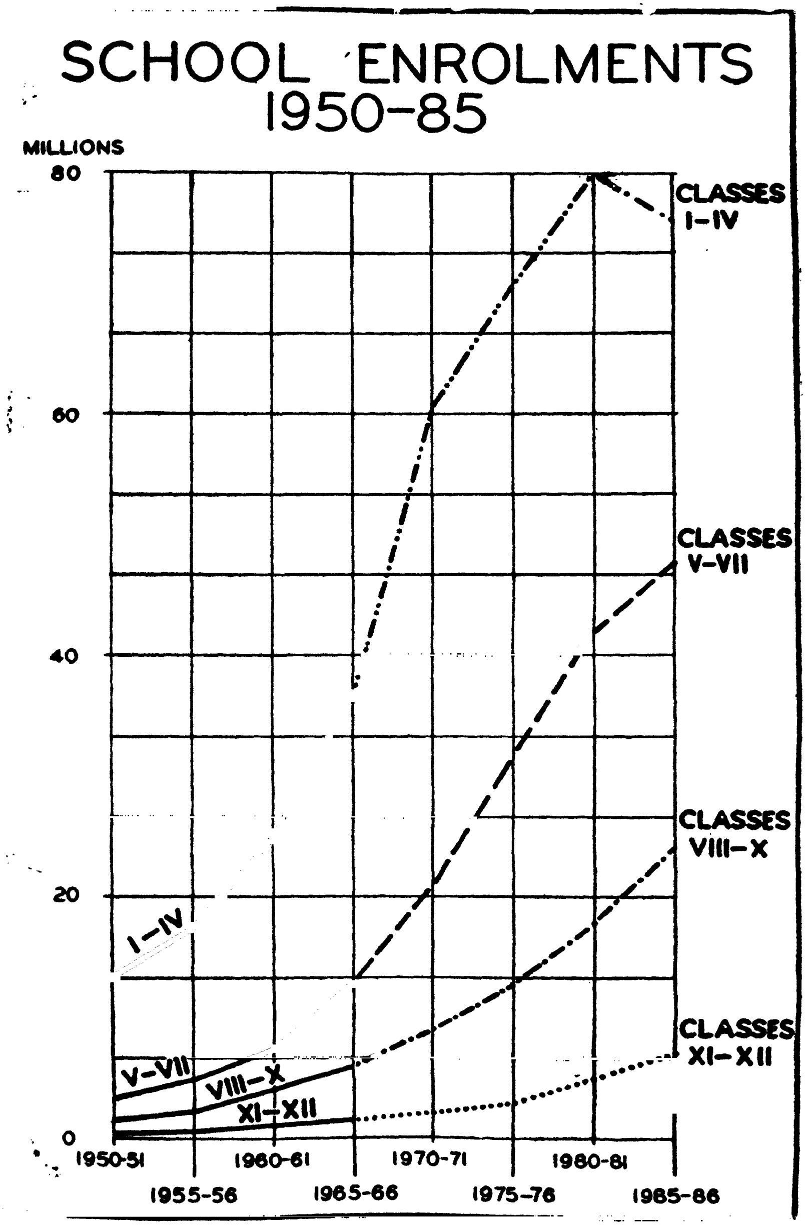
SCHOOL ENROLMENTS 1950-85

TABLE 7·7. VOCATIONAL EDUCATION AT THE SECONDARY STAGE

(including in Table 7·6)

Stage/Years	Enrolments in vocational education (000's)			Percentge of enrolments in vocational education to total enrolment		
	Boys	Girls	Total	Boys	Girls	Total
Classes VIII—X						
1950-51	29 (6·1)	18 (12·2)	46 (9·1)	2·2	8·8	3·1
1955-56	39 (10·8)	32 (1·8)	71 (7·1)	2·0	7·9	3·0
1960-61	65 (6·7)	35 (6·1)	100 (6·5)	2·2	4·7	2·7
1965-66	90 (19·7)	47 (19·2)	137 (19·6)	1·9	3·3	2·2
1970-71	222 (19·7)	113 (19·2)	335 (19·6)	3·4	5·0	3·8
1975-76	546 (19·7)	272 (19·2)	818 (19·6)	6·0	7·6	6·4
1980-81	1,344 (19·7)	655 (19·2)	1,999 (19·6)	11·0	12·1	11·4
1985-86	3,305	1,568	4,873	20·0	20·0	20·0
Classes XI—XII						
1950-51	105 (11·3)	20 (11·8)	125 (11·4)	42·7	53·6	44·2
1955-56	179 (10·8)	35 (11·0)	214 (10·8)	41·6	49·4	42·7
1960-61	299 (9·8)	59 (8·1)	358 (9·5)	41·7	41·9	42·2
1965-66	477 (8·6)	87 (12·6)	564 (9·3)	40·7	38·5	40·3
1970-71	721 (8·6)	157 (12·6)	878 (9·4)	42·5	40·2	42·1
1975-76	1,089 (8·6)	284 (12·6)	1,373 (9·5)	46·3	44·5	45·9
1980-81	1,645 (8·7)	514 (12·7)	2,159 (9·7)	48·1	47·2	47·9
1985-86	2,502	934	3,436	50·0	50·0	50·0

Source. Ministry of Education Form A, for data up to 1960-61. Data for 1965-66 were estimated in the Secretariat of the Commission.

N.B. (i) Figures in parentheses show average annual rate of growth in the quinquennium concerned.

(ii) Totals do not tally on account of rounding.

It will be seen that:

— at the lower secondary stage, the enrolment in vocational education was about 3 per cent in 1950-51. In 1965-66, it declined to 2.2 per cent because of a very rapid increase in general education. It is assumed that a systematic attempt will be made to introduce vocational courses at this stage, either part-time or full-time, and to increase the enrolment in these courses, by 1986, to about 20 per cent of the total enrolment. This is the most challenging part of the work to be done at this stage:

- at the higher secondary stage, the enrolment in vocational courses is now about 40 per cent of the total enrolment. Allowance has to be made here for the fact that the general education course is now only of one year's duration. If it were lengthened to two years, this proportion of enrolment in vocational courses would fall to about 20 per cent. One of the major reforms we envisage is to vocationalize higher secondary education and to raise the enrolments in the vocational courses at this stage to 50 per cent of the total enrolment.

7.48. How can these objectives be realised and what are the types of vocational education that can be provided at this stage?

(1) *Lower Secondary Stage.* The following are the courses which can be organized for students who leave school at the end of Class VII or VIII:

(a) In the industrial training institutes, there are courses which are open to those who have completed the primary school. If the age of admission to these courses is reduced to 14,[1] a large number of students who have completed the primary school will be able to enter these courses of industrial training.

(b) The terminal programmes provided in technical schools which will prepare students for jobs in industry form another category of the vocational courses at this stage. The details of the programme are discussed elsewhere[2].

(c) A large number of the students who drop out after Class VII or Class VIII will enter employment in family business, some with the idea of setting up their own small-scale industry or trade. A wide range of courses should be available on a part-time basis for them to obtain qualification or to upgrade their skills. Examples of the type of courses which can be offered are given in the annexures to Chapters XIV and XV. We recommend that a special section should be set up in the Education Departments which will remain in touch with such young persons, help them to obtain suitable opportunities for training either on a full-time or on a part-time basis and also provide them, side by side, with some general education.

(d) A large proportion of the rural boys will join the family farm. They will have to be provided with further education which will enable them to improve their professional efficiency and general education.

(e) A large proportion of girls will leave school and get married either immediately or a little later. They should be given further education in home science combined with general education.

(2) *Higher Secondary Stage.* A wide range of vocational courses will be available at this stage.

(a) Apart from the expansion of facilities for full-time studies in those polytechnics which have been recommended in Chapters XIV and XV, we envisage the development at this stage of part-time vocational courses in industry arranged on either a day-release, sandwich or correspondence course basis.

(b) Agricultural and engineering polytechnics should organize short condensed courses for the upgrading of skills of those who have entered into employment or the retraining and re-education of those already qualified.

(c) A large number of courses offered in industrial training institutes require the completion of Class X as a qualification for entry. We have

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1. This was 16 and is now reduced to 15. For details, see Chapter XV.
2. *Ibid.*

recommended[1] a rapid expansion of these facilities.

(d) In addition to the courses so far described, a wide range of other courses in health, commerce, administration, small-scale industries and the services should be developed ranging in duration from six months to three years for a certificate or a diploma qualification. These can also be offered on a part-time basis or through correspondence for those already in employment. The lists of such coursese annexed to Chapters XIV and XV give an idea of the scope of the facilities which the Commission has in mind.

In view of the importance of the programme and the large scale of the operations to be undertaken, it is essential that special sections should be created within the State Departments of Education and charged with the overall organization of courses of this nature, whether full-time or part-time. In organizing such programmes the sections should bear in mind the manpower needs and work in close collaboration with the machinery for vocational guidance and with industry and employers generally.

7.49. **Central Grants for Development of Vocational Education at the School Stage.** We attach very great importance to the vocationalization of secondary education. For this purpose, we recommend that the Central Government should provide special grants to State Governments in the centrally sponsored sector. It was the federal grants for vocationalization in secondary schools that stimulated the vocationalization of secondary education in the USA, and this experience has a valuable lesson for India. The following description of the American experience will be of interest to those concerned with the problem.

> Federal grants for vocational education began with the Smith-Hughes Act of 1917. The activity was directed at the development of what was regarded as a neglected area of education. That is, high school programmes were seen as strongly oriented toward preparation for college; students whose plans did not include college were offered little or no instruction in preparation for useful employment.........Smith-Hughes provided continuing appropriations in support of salaries of teachers of agriculture, home economics, trades and industry, and the distributive occupations.........Additional monies were appropriated for preparation of vocational teachers and for administration of the act by the U.S. Office of Education.
>
> The George-Barden Act of 1946 authorized appropriations of additional sums for training in the four main fields of vocational education listed above..................The requirements for participation by states in this Act are essentially the same as in the Smith-Hughes.........
>
> Finally, under Title VIII of the National Defence Education Act of 1958 an additional $ 15 million is authorized, specifically to be used for area vocational schools in the training of highly skilled technicians.......
>
> Since the intent of the grant programmes has been to stimulate activity, it must be stated that they have been successful. In 1917, something less than $ 3 million was spent on vocational education by all levels of government, and there were less than 200,000 pupils enrolled. Forty years later, expenditure stood at $ 176 million and enrolment had increased to 3.4 million pupils. It is hard to believe that advance would have been so great in the absence of federal leadership. At present federal funds are overmatched by both state and local expenditures taken separately.[2]

7.50. **Part-time Education.** Another important aspect of the expansion of secondary education is the need to provide part-time education. This hardly exists at present; and it will have to be expanded very largely on the following lines.

(1) *Lower Secondary Stage.* We visualize the following programmes:

(a) Some students who have completed the primary school and are unable to continue their studies on a full-time basis may wish to prepare themselves for the high school examination at the end of Class X. Part-time courses similar to the full-time ones should be organized for such students on the lines of the courses in existing night high schools. The courses are expected to be run, by and large, in the buildings of the full-time schools so that part-time students may use the same equipment. The teachers will also be largely drawn from the same source and receive extra payment for the work. Ordinarily, the students will take a somewhat longer time to complete these courses.

(b) Courses of the above type will, however, be few, and the large majority of part-time education will be of a vocational character required by those who have actually adopted some career and desire to improve their professional efficiency. The success of these programmes, which will be of various types, will depend upon the flexibility of organization and the extent to which they meet the needs of the students. However, the following two types will be the most important:

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[1] Chapter XV.

[2] C.S. Benson. *The Economics of Public Education* Houghton Mifflin Co., New York. pp. 262-63.

(i) COURSES IN AGRICULTURE. We recommend that part-time courses should be organized for students who have left the primary school and taken to farming as a vocation. The principle object of these courses should be to introduce the young persons to improved farming methods, but they will also contain an element of general education. They may be arranged to suit the convenience of the students; for example, they may be run one or two days a week or on a full-time basis for two to six weeks in a year. Such courses can be conducted in the agricultural polytechnics proposed to be set up, the agricultural high schools and especially at the primary extension centres.[1] If vigorous steps are taken in this direction, we believe that about one-third to one-half of the total enrolment in vocational education would be in courses of this type.

(ii) SPECIAL COURSES FOR GIRLS. For girls leaving the primary school at about the age of 14, we propose the organization of part-time or full-time courses in home science or household industries like tailoring, arts and crafts, poultry, dairying, etc., to prepare them better for their future life as housewives and mothers. These may be short full-time courses or part-time courses over a long duration and can be both useful and popular.

(2) *Higher Secondary Stage*. Programmes of part-time education at this stage are very important and will include the following:

(a) part-time courses organized on the general pattern of the full-time ones meant for those who would like to pass the higher secondary examination;

(b) part-time courses in agriculture for those who have taken to agriculture as a career;

(c) part-time courses in industry for those who have joined it;

(d) special courses for girls on the lines of those recommended at the lower secondary stage, but conducted at a higher level in view of the better general education which the students would have received; and

(e) part-time courses for those who want to be self-employed.

7.51. The scale of enrolments we have in view for part-time education is indicated below.

(1) *Lower Secondary Stage*. At present, most of the enrolments at this stage is on a full-time basis. There are a few night high schools in big cities which provide part-time education to workers; but their enrolment is extremely small. It is now expected that efforts will be made to provide part-time education on a large scale, and that one-fifth of the total enrolment will be on a part-time basis.

(2) *Higher Secondary Stage*. The measures to be adopted at this stage will be similar to those mentioned above, and we expect about one-fourth of the total enrolment to be in courses of part-time or correspondence education.

7.52. **Education of Girls.** Special emphasis has been laid in these proposals on the expansion of secondary education among girls. It will be seen from Table 7.6 that

—at the lower secondary stage, the proportion of the enrolment of girls to that of boys was about 1:6 in 1950-51 and that it is now 1 : 3. During the next twenty years, this will rise to 1:2; and

—at the higher secondary stage, the proportion of the enrolment of girls to that of boys was about 1:6.5 in 1950-51 and that it is now about 1:5. During the next twenty years, it is proposed to be raised to 1 : 3.

7.53. Special efforts would be needed to achieve an expansion of this order. The problem has been examined by the National Committee on Women's Education and we broadly agree with its detailed recommendations on the subject. In particular, we would like to invite attention to the following:

(1) Public opinion is generally not in favour of accepting coeducation at the secondary stage. Separate

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[1] See Chapter XIV.

schools for girls should, therefore, be specially encouraged. In smaller places where separate schools are not financially feasible, there should be a rule that a school which admits girls should have some women members on its staff.

(2) Hostels for girls should be encouraged. Where feasible, subsidized transport may be arranged.

(3) Special consideration should be shown to girls in the scholarships programme that may be developed at this stage.

7.54. We have deliberately emphasized the development for part-time and vocational education for girls at this stage. As girls are more useful at home, they tend to be withdrawn from schools earlier than boys, and, therefore, the provision of part-time education is more needed for them than for boys. The same is true of vocational education also. A vast majority of girls that leave school at 14 would be benefited by short vocational courses or by courses in home science which would help them in their future life. These need greater emphasis than a mere continuation of general education.

PLANNING THE LOCATION OF SCHOOLS

7.55. In planning the expansion of facilities in primary and secondary education on the scale which has been described earlier, one of the important problems to be attended to is the planning and location of schools. The need to adopt a rational policy in this matter is obvious: proper location will avoid waste and duplication, and size is related intimately to cost and efficiency. Institutions of vocational education should invariably be located in close proximity to the industries concerned, otherwise they will serve little useful purpose, and in some situations the results may be even pernicious. Unfortunately, it has not yet been possible to evolve and implement a proper policy in this regard: several of our institutions are badly located; many of them are too small; and some are too big to be manageable. It is desirable for the State Education Departments concerned with the planning of educational institutions, to evolve some guide-lines for determining the location and size of each category of educational institutions. We make below some tentative proposals for this purpose.

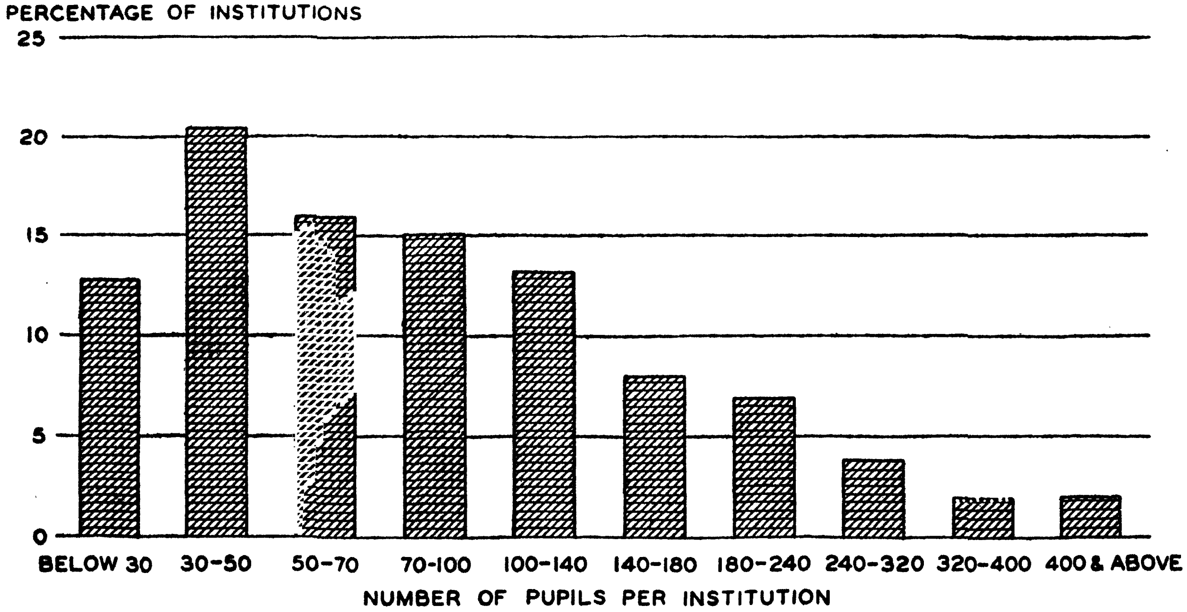
7.56. **Primary Schools.** At this stage, accessibility is the over-riding consideration and small schools, in spite of their heavier cost and lower efficiency, must be accepted. The optimum size of a school is: for a lower primary school—4 or 5 teachers and an enrolment of 160 to 200, *i.e.*, a school of 4 or 5 classes; and for a higher primary school, a school of 7 or 8 classes, a teacher for each class (excluding the headmaster) and an enrolment of 300—400. Wherever possible, schools of this size (or even bigger ones) should be established. This can be done in all urban areas and in villages of 1,500 persons or more. Since, however, small villages predominate, small schools will have to be established, in spite of their comparatively greater cost and lower efficiency. The general rule should be to establish a lower primary school within a mile or so of the home of every child and a higher primary school, within three miles. Villages with a population of 200—300 should have a lower primary school and those with a population of 700 or more should have a higher primary school. The present position at the lower primary stage is given in Table 7.8 and in the chart on page 177.

TABLE 7·8. DISTRIBUTION OF LOWER PRIMARY SCHOOLS/SECTIONS ACCORDING TO SIZE (1965)

State	Percentage of Lower Primary Schools with Enrolment										
	Below 30	30—49	50—69	70—99	100—139	140—179	180—239	240—319	320—399	400 and above	Total
Andhra Pradesh	6·4	20·9	19·3	21·4	15·1	7·4	4·9	2·6	1·6	0·4	100·0
Kerala	0·1	0·2	0·6	2·6	25·1	19·8	19·3	12·7	6·7	12·9	100·0
Madhya Pradesh	32·3	20·6	19·6	10·6	9·1	2·8	2·5	1·3	0·6	0·6	100·0
Maharashtra	14·3	24·8	17·8	10·7	8·8	6·1	6·4	4·5	2·8	3·8	100·0
Mysore	11·8	20·7	14·7	16·1	13·6	8·1	7·0	3·9	2·2	1·9	100·0
Orissa	20·0	31·6	16·6	13·8	7·7	5·3	3·6	1·1	0·3	..	100·0
Punjab	6·2	14·0	16·8	25·0	16·5	7·6	6·2	2·8	1·7	3·2	100·0
Rajasthan	24·0	27·3	17·5	12·3	8·8	4.1	3·2	1·5	0·6	0·7	100·0
Uttar Pradesh	4·2	12·5	13·5	18·8	18·5	13·0	11·5	5·7	1·5	0·8	100·0
TOTAL	12·7	20·4	15·9	15·1	13·2	8·0	6·9	3·9	1·9	2·0	100·0

Source. Data supplied by the State Governments (based on a study of 29 districts).

LOWER PRIMARY SCHOOLS / DEPARTMENTS, BY SIZE, 1965



It will be seen that about one-third of all primary schools have an enrolment of less than 40 pupils, and about two-thirds have an enrolment of less than one hundred. Only about one-fourth of the schools have an enrolment of 140 and more, where a teacher can be placed in charge of each separate class.

7.57. Similar data for the higher primary schools is given in Table 7.9. (See also chart on page 179).

TABLE 7·9. DISTRIBUTION OF HIGHER PRIMARY SCHOOLS/SECTIONS ACCORDING TO SIZE (1965)

State	Percentage of Higher Primary Schools with Enrolment										
	Below 20	20—39	40—59	60—79	80—119	120—159	160—199	200—279	280—399	400 and above	Total
Andhra Pradesh .	8·3	14·5	9·3	12·4	11·7	10·1	7·8	7·1	9·0	9·8	100·0
Kerala . .	..	0·5	2·6	4·9	21·3	17·6	12·4	14·9	14·3	11·5	100·0
Madhya Pradesh .	13·9	22·6	17·5	12·8	15·7	6·8	3·8	2·9	3·1	0·9	100·0
Maharashtra . .	11·0	15·9	14·3	12·1	12·4	9·8	5·5	2·3	0·8	..	100·0
Mysore . .	13·8	22·8	19·5	13·3	14·3	6·1	4·4	3·6	1·7	0·5	100·0
Orissa . . .	5·1	29·4	21·8	12·9	12·4	9·8	5·5	2·3	0·8	..	100·0
Punjab . .	1·1	4·6	16·1	10·3	10·4	15·0	16·1	16·1	5·7	4·6	100·0
Rajasthan . .	2·8	6·7	14·3	15·2	23·5	12·7	9·8	6·4	4·2	4·4	100·0
Uttar Pradesh .	5·7	4·2	7·1	8·4	21·5	15·2	11·7	11·9	12·6	1·7	100·0
TOTAL .	9·3	15·9	14·2	11·7	15·0	10·3	7·6	7·0	5·6	3·4	100·0

Source. Data supplied by the State Governments. The enrolments given in this table are of the higher primary classes (Classes V—VII or VI—VIII) only. Most of these schools have also lower primary classes attached to them.

It may be assumed that the enrolment in the higher primary classes should be about 120 so that one teacher can be put economically in charge of each class. On this basis, only one-third of the schools will qualify. Even if it is assumed that the enrolment in the higher primary classes should be about 60, 40 per cent of the institutions fall below this level.

7.58. We do not under-estimate the difficulties involved in the arrangement proposed above. We feel, however, that the establishment of larger and more efficient primary schools would be facilitated if people could be persuaded to accept mixed schools at the primary stage and if small neighbouring villages could be induced to share a bigger and more efficient school in common, instead of insisting on their own schools, however small. We recommend that attempts should be made to educate public opinion on these lines.

7.59. The problem of small villages is serious. The first education survey—now under revision—showed that out of the 840,000 habitations in the country, 254,000 (or 30 per cent) had a population of less than 100; 189,000 (or 23 per cent) had a population between 100 and 199; and 114,000 (or 14 per cent) had a population between 200 and 299. They also contained about 25 per cent of the total population. A long-term goal should be to merge these villages into bigger ones. In the meantime, they should be grouped together, wherever possible, so as to make the economic provision of schools (and other social services) possible.

7.60. **Secondary Schools.** In secondary education and still more so in higher education, accessibility becomes a comparatively minor consideration, and the emphasis has to be shifted to the creation of institutions of a size that is economic and efficient. The significance of this policy is not appreciated and there are at present a very large number of small secondary schools which it is extremely costly and difficult to improve to adequate levels of efficiency. How bad the situation actually is can be seen from Table 7.10 giving statistics collected by the Commission in twenty-nine districts. (See also chart on page 181).

HIGHER PRIMARY SCHOOLS / DEPARTMENTS BY SIZE 1965

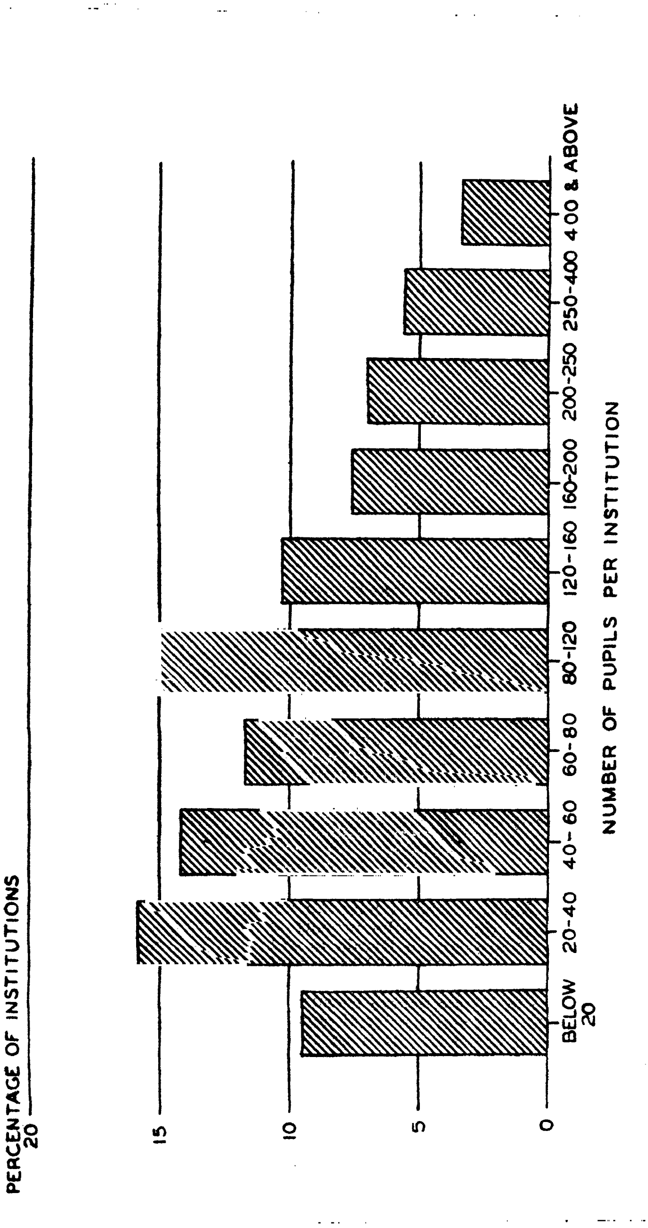


TABLE 7·10. DISTRIBUTION OF HIGH/HIGHER SECONDARY SCHOOLS/SECTIONS ACCORDING TO SIZE (1965)

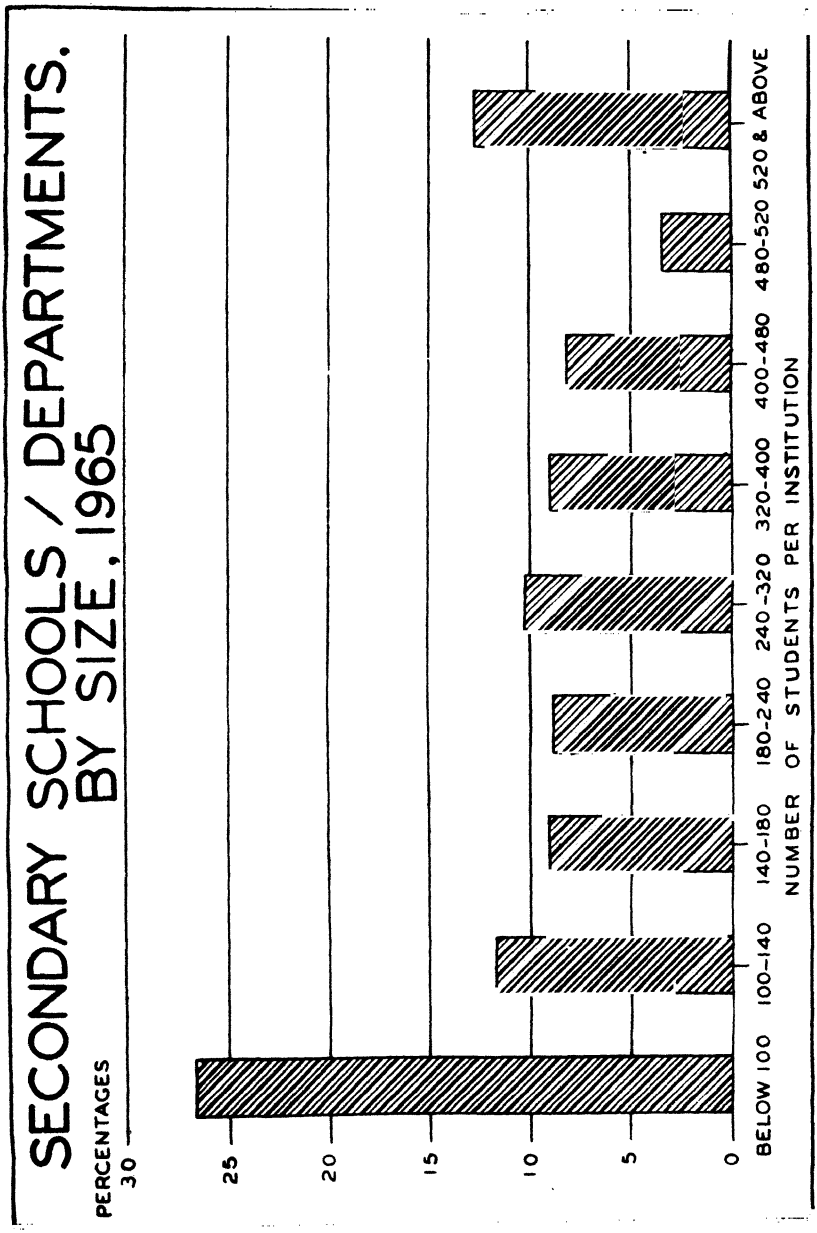
State	Percentage of High/Higher Secondary Schools with Enrolments									
	Below 100	100—139	140—179	180—239	240—319	320—399	400—479	480—519	520 and above	Total
Andhra Pradesh	41·1	15·2	8·1	9·3	7·4	6·7	6·3	0·7	5·2	100·0
Kerala	4·5	8·3	4·5	8·3	9·6	12·8	8·4	3·2	40·4	100·0
Madhya Pradesh	35·5	10·5	11·9	13·2	9·2	7·9	3·9	2·6	5·3	100·0
Maharashtra	25·6	8·2	7·8	4·4	11·1	11·0	14·1	7·2	10·6	100·0
Mysore	19·9	11·7	10·6	11·4	13·1	8·2	7·1	2·8	15·2	100·0
Orissa	29·2	19·2	19·2	16·6	8·3	5·0	2·5			100·0
Punjab	36·4	15·2	21·2	9·1	9·1	3·0	3·0	..	3·0	100·0
Rajasthan	45·1	21·4	8·4	9·5	7·2	2·4	..	2·4	3·6	100·0
Uttar Pradesh	21·3	11·6	5·8	13·5	11·7	10·4	3·2	0·6	21·9	100·0
TOTAL	26·6	11·7	9·1	8·9	10·3	9·0	8·2	3·5	12·7	100·0

Source. Data supplied by the State Governments.

In order to be well equipped and efficient, a secondary school should have at least three divisions in each of the three classes of the secondary stage, *i.e.*, a total of nine divisions and an enrolment between 360 and 450. With a school of this size, a staff of about 20 teachers is possible and all the necessary facilities can be provided without increasing the cost per student unduly. If the specifications are lowered to two divisions per class or a total of six divisions—and this is the very minimum possible—the enrolment wil be between 240 and 300. But the existing position is unsatisfactory on both these criteria. As many as 26.6 per cent of our secondary schools have an enrolment of less than 100—the proportion varying from 4.5 per cent in Kerala to 45.1 per cent in Rajasthan. About 38.3 per cent have an enrolment of 400 and over. The best position is in Kerala, where because of continuous habitation and density of population, 52 per cent of schools have an enrolment of 400 and over. The worst position is probably in Rajasthan where only 15·6 per cent of the schools have an enrolment of 240 and above.

7.61. The policy implications are clear. An effort has to be made to slow down the proliferation of small and uneconomic institutions. It should be difficult for new secondary schools to be established except in areas where a clear local need can be proved and where there is a reasonable chance of the new school growing to a reasonable size within five years or so. To achieve this, it is desirable to prescribe stringent conditions for recognition and to enforce them strictly. A good working rule would be to establish a secondary school serving a radius of five to seven miles with a total population coverage of 10,000 to 15,000: and to adopt the practice of providing transport in the form of a bicycle to students who live at comparatively long distances, and hostel facilities, where necessary. In certain areas, secondary schools have already proliferated to such an extent that it is not the establishment of new secondary schools, but the consolidation of existing ones that is the urgent need of the day.

7.62. **Vocational Schools.** Institutions of vocational education have to be large in size to be economical and efficient. The existing position in this regard (the latest statistics available are for 1961-62) is given in Table 7.11.



SECONDARY SCHOOLS / DEPARTMENTS. BY SIZE, 1965

TABLE 7·11. SIZE OF VOCATIONAL SCHOOLS (1961-62)

Type of institution	No. of institutions	Total enrolment	Enrolment per institution
1. Agriculture	106	8,428	80
2. Engineering and Technology	295	86,228	292
3. Medicine	177	11,257	64
4. Teachers' Training Schools	1,134	121,652	107
ALL VOCATIONAL SCHOOLS	3,849	419,043	109

Source. Ministry of Education, Form A.

It will be seen that schools of agriculture are too small to be efficient. Medical schools are also of a small size, but this is probably unavoidable as these institutions are mostly attached to hospitals. The training schools for primary teachers as well as the training colleges for secondary teachers are also very small in size. Elsewhere, we have recommended that the minimum size of such an institution should be about 200 for colleges (one-year course) and 400 for schools (two-year course).[1] Care will also have to be taken to see that all vocational schools are so located as to be close to the industry concerned. This has not always happened and we have witnessed instances where polytechnics have been located in a rural setting where there is no industry, and agricultural institutions located in urban areas where they do not and cannot have a farm of adequate size. Locations of this type lead to infructuous expenditure and should be avoided.

7.63. The need to prepare careful plans for the location of educational institutions and the development of all school education within a given area such as a County Council was recognised in England as early as in 1940, and due provision for it was made in the Education Act of 1944.[2] The results have been very good and this experience can be of great use to us in evolving suitable criteria and in preparing District Educational Development Plans. We trust that the new education survey will be used for the preparation of such plans.

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[1] Chapter IV.

[2] Sections 11—16 of the *Education Act of England and Wales*, 1944.

CHAPTER VIII

SCHOOL CURRICULUM

I. *Essentials of Curricular Development.* (3) Measures needed for curricular development: (5) Relating curricula to available facilities; (6) Freedom to schools to adopt experimental curricula; (7) Gradual introduction of advanced curricula; (9) Subject teachers' associations.

II. *Organization of Curriculum.* (10) Curriculum of the first ten years; (11) Scheme of multipurpose schools; (14) Standards of attainment at the different stages; (19) Curriculum at the lower primary stage; (21) Curriculum at the higher primary stage; (23) Curriculum at the lower secondary stage; (24) Curriculum at the higher secondary stage; (28) Special areas in the higher secondary course; (29) Advanced and enrichment programmes at different stages.

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V. *Social Studies and Social Sciences.* (67) Organizing the syllabus in different ways; (69) Emphasis on national and world unity; (71) Study of social sciences.

VI. *Work-Experience.* (73) Programmes at the different stages; (75) Work-experience and basic education; (78) Implementation.

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X. *Creative Activities.* (100) Art education; (101) Co-curricular activities.

XI. *Differentiation of Curricula between Boys and Girls.* (102—04).

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8.01. The school curriculum is in a state of flux all over the world today. In developing countries it is generally criticised as being inadequate and outmoded, and not properly designed to meet the needs of modern times. Even in an educationally advanced nation like the USA, where the traditional curriculum had been radically transformed long ago under the impact of progressive education, the content of the school courses is being challenged by several scholars and university men, and a new reform movement has ben started which may bring in sweeping curricular changes in schol education. This widespread dissatisfaction with the curriculum is due to many causes. In the first place, the tremendous explosion of knowledge in recent years and the reformulation of the basic concepts in the physical, biological and social sciences has brought into sharp relief the inadequacies of existing school programmes. The gulf between the school and the university in the major academic disciplines, which was always wide, has become wider still with the rapid advance of science. Secondly, there has been a rethinking in educational circles about the nature and duration of the education that is imparted in the ordinary secondary school. Expert opinion now generally favours the lengthening of the period of general education and the postponement of specialised study to a later period in the secondary school course. Again, with the necessity of including more and more significant items in an already overpacked school curriculum, it is realized that there is a good deal of useless educational lumber in the school courses which can be safely discarded, and that more dynamic and stimulating methods can be developed for presenting essential knowledge. All these factors are responsible for the increasing pressures for the reform of the school curriculum.

8.02. Against the background of the striking curricular developments that are taking place abroad, the school curriculum in India will be found to be very narrowly conceived and largely out-of-date. Education is a three-fold process of imparting knowledge, developing skills and inculcating proper interests, attitudes and values. Our schools (and also our colleges) are mostly concerned with the first part of the process—the imparting of knowledge—and carry out even this in an unsatisfactory way. The curriculum places a premium on bookish knowledge and rote learning, makes inadequate provision for practical activities and experiences, and is dominated by examinations, external and internal. Moreover, as the development of useful skills and the inculcation of the right kind of interests, attitudes and values are not given sufficient emphasis, the curriculum becomes not only out of step with modern knowledge, but also out of tune with the life of the people. There is thus urgent need to raise, upgrade and improve the school curriculum.

ESSENTIALS OF CURRICULAR DEVELOPMENT

8.03. **Measures Needed for Curricular Development.** Most of the curricular revision attempted so far has been of an ad hoc character—not generally preceded by careful research, not based on adequate expertise and not followed by such necessary supporting measures as the preparation of learning materials, the orientation of teachers or the provision of the needed physical facilities. What is worse, the curricula are prepared at the State level and are prescribed uniformly for all the schools in the State. Such a procedure cramps the freedom of headmasters and teachers and renders experimental work almost impossible. It also makes curriculum revision very difficult and infrequent. This problem which faces education at all stages is particularly acute at the school level. It is this weakness of school education that compels colleges to spend time on what is essentially school work; and the content of higher education cannot be adequately deepened until the school curricula are upgraded and made more challenging.

8.04. For upgrading the school curriculum, a number of important steps have to be taken. The more important of these have been indicated below.

(1) *Research in Curriculum.* The first is the need for systematic curricular research so that the revision of the curriculum may be worked out as a well coordinated programme of improvement on the basis of the findings of experts instead of being rushed through haphazardly and in a piecemeal fashion, as often happens in many States today. Facilities for such research should be established in the universities, in the secondary training colleges, in the State Institutes of Education and in the State Boards of School Education. It would also be advantageous to have some experts in curriculum on the staff of the State Boards of School Education who would work in close collaboration with the State Evaluation Organizations and the State Institutes of Education.

(2) *Preparation of Textbooks and other Teaching Aids.* Basic to the success of any attempt at curriculum improvement is the preparation of suitable textbooks, teachers' guides and other teaching and learning materials. These define the goals and the content of the new programmes in terms meaningful to the school, and as actual tools used by the teacher and the pupil, they lend substance and significance to the proposed changes.

(3) *In-service Education of Teachers.* In addition to this, it is necessary to make the teacher understand the chief features of the new curriculum with a view to developing improved teacher competence, better teaching skills, and a more sensitive awareness of the teaching-learning process in the changed situation. Accordingly, an extensive programme of in-service education consisting of seminars and refresher courses, should be arranged to orient the teachers to the revised curriculum.

8.05. **Relating Curricula to Available Facilities.** A curriculum should be related to the quality of teachers, the facilities available in the school and the needs of the students with reference to their socio-economic background. These vary immensely from one institution to another. Consequently, a single State curriculum designed to serve the needs of the average school ceases to be meaningful for the large variety of institutions in the State. It proves to be beyond the competence of the weaker institutions and fails to provide an adequate challenge to the better ones. The solution lies in making it possible for schools to devise and adopt curricula suited to their own needs and to vie with one another in upgrading them.

8.06. **Freedom to Schools to Adopt Experimental Curricula.** Two steps are needed before this development can take place. The first is to permit schools to try out experimental curricula. The general rule should be that a school will follow the common curricula prescribed by the Department unless it has prepared alternative curricula of its own and adopts them with the prior approval of the Department. Such a provision is found in some States even today, but it exists only on paper. Most schools do not have the courage and the ability to take advantage of this freedom, and those that do embark on any bold curricular venture often find their enthusiasm dampened on account of the vagaries of an unimaginative educational administration. There is need for greater initiative and competence on the part of the schools and a more liberal attitude on the part of the Department for promoting experimentation. Teacher training institutions having model or demonstration schools under them can give a lead in this matter. The same can be done by universities in the experimental schools which, as recommended by us, should be conducted by them for the improvement of quality in school education.

8.07. **Gradual Introduction of Advanced Curricula.** The second, and even more significant step, would be for the State Boards of School Education to prepare advanced curricula and introduce them progressively in all the schools and all the subjects through a phased programme spread over a number of years. For this purpose, the Boards should finalize two sets of curricula, advanced and ordinary. The ordinary curriculum would be common for all the schools. The advanced curriculum would be one which can at present be adopted only by the good schools but which may become the ordinary curriculum, let us say, about ten years hence. For instance, we have recommended in Chapter II that the standard reached in the external examination at the end of Class X at present should be gradually raised, within a period of about ten years, to the standard of the present higher secondary, (i.e., the standard reached at the end of Class XI). In terms of this recommendation, the present curriculum for Classes I to X would be the ordinary curriculum, and the proposed curriculum for the same classes (with the content raised to the higher secondary level) would be the advanced curriculum. This is stated by way of illustration only; and we would like to stress that an advanced curriculum does not necessarily imply the teaching of topics generally prescribed for higher classes. It may also mean a study of the given subject at much greater depth than is done in the ordinary curriculum.

8.08. State Boards of School Education should prescribe conditions for introducing the advanced curriculum in a given subject in terms of the qualifications and competence of the teachers and the facilities required. Schools which satisfy these conditions should be allowed to introduce the advanced courses while others teach the ordinary ones. The introduction of advanced courses would involve the following measures:

- — A school need not adopt the advanced curriculum in all the subjects. It may begin with one or two subjects, and then gradually cover more subjects, or even the entire course in a well-planned programme suited to its convenience.
- — It should be open to a student in a school which has not adopted the advanced curriculum to prepare himself privately for it if he so desires.
- — The Board of School Education should arrange for examining candidates at the external examinations in both the advanced and the ordinary courses.
- — A beginning should be made with the introduction of advanced courses in some subjects at least such as science, mathematics and languages, in those schools which are ready (or can be helped to get ready in a short time) to adopt them.
- — In course of time, more and more schools should be assisted to adopt the advanced courses by securing qualified teachers and providing the needed facilities. Every year such 'aspirant' schools should be identified and given the necessary assistance to develop the advanced curriculum. An essential part of this assistance consists in preparing the teachers for handling the new courses.

Under a programme of this type, it will be possible to introduce advanced courses progressively in one school after another until most of the schools and almost all school subjects are covered. Once the programme is initiated, a healthy competition will arise among several schools to opt for the advanced courses, which will have much prestige value. If this enthusiasm is properly utilised and encouraged, the curriculum will be upgraded in due course in all the institutions and the whole process can then be restarted towards some higher goal. We will thus have a built-in mechanism in the educational system which will operate for a continual deepening of the content of school education.

8.09. **Subject Teachers' Associations.** We would like the State governments to encourage the formation of subject teachers' associations for the different school subjects. This will stimulate initiative and experimentation and assist in the revision and upgrading of curricula through the provision of better teaching materials and the use of improved techniques of teaching and evaluation. It should be a responsibility of the State Education Departments, working through the State Boards of School Education, to assist the subject teachers' associations to hold periodical seminars and conferences and to conduct journals of their own, most of which would naturally be in the regional languages. The NCERT should coordinate the work of each State-level association, help the formation of all-India subject teachers' associations and assist in running journals at the national level, in English and in Hindi, for the use of teachers all over India.

ORGANIZATION OF THE CURRICULUM

8.10. **Curriculum of the First Ten Years.** We shall now consider the broad features of the curriculum as it should be organized to achieve the objectives of school education. For the first seven years of schooling, as we have indicated elsewhere, there will be an undifferentiated course of general education for all. Of those who continue their studies after Class VII, an estimated 20 per cent are expected to be provided with full-time or part-time vocational education, the nature and scope of which have been indicated in the previous chapter. The remaining 80 per cent of the pupils at school should, in our opinion, continue to receive general education for a further period of three years, without any diversification of studies, but with provision of courses at two levels and of options in creative activities and types of work-experience. In other words, for the vast majority of pupils there would be a single curricular stream from Class I to Class X, ending with the first external or public examination, and there would be no 'streaming' or specialization in this general course.

8.11. **Scheme of Multipurpose Schools.** It will be seen that this proposal is quite different from the scheme of higher secondary education recommended by the Secondary Education Commission, which has been under implementation in certain States during the last ten years. This scheme required a diversification of studies at the end of Class VIII and the provision of a variety of courses for students in Classes IX to XI. A number of multipurpose higher secondary schools have been opened offering different groups of elective subjects to students in the last three classes. Students are divided into streams according to their optional groups, and the opportunities for further education are determined, by and large, in terms of the groups selected.

8.12. In discussing the structure of the educational system[1], we referred to the basic defects of the higher secondary pattern. The multipurpose schools, which should really be called multilateral schools, reproduce these defects in an intensified form. Most of the students who join these schools have only one purpose in view—to pursue their studies further at a university. Consequently, streams like fine arts and agriculture and even the technical stream, which do not lead to popular courses at the university stage are taken up by few students, and the science course is at a high premium. At the present stage of our economy, a multiplicity of expensive courses catering for the special interests of small groups of students cannot be prescribed in schools of general education. An analysis of the different groups of electives in the existing multipurpose schools will show that comparatively few schools have more than three diversified groups, so that one of the main objects for which the scheme of diversification was introduced—to provide a variety of courses to suit the different interests, aptitudes and interests of adolescent students—has not been realized.

8.13. One of the major weaknesses in the scheme is that specialization of studies begins too early. We have seen schools where, at the age of 13 or 14, the students are classified as belonging to the pre-engineering or the pre-medical section. The streaming of pupils in this way into specialized groups from Class IX upwards is undesirable. We mentioned earlier[1] that recent world trends in secondary education are in the direction of lengthening the period of general education and postponing diversification and specialization to the second cycle or senior stage of secondary education. We, therefore, recommend that in the non-vocational schools a common curriculum of general education should be provided in the first ten years of school education and that diversification of studies and specialization should begin only at the higher secondary stage.

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8.14. **Standards of Attainment at the Different Stages.** Though the curriculum of the first ten years of general education covering seven years of primary education (four years of lower primary and three years of upper primary) and three years of lower secondary education should be organized as a continuous programme of studies, the standard of attainment at the end of each sub-stage in the total course should be clearly indicated. These standards should be defined in terms of the knowledge, skills, abilities and attitudes to be developed with reference to the overall objectives of school education.

8.15. At the lower primary stage (Classes I to IV) the child should receive instruction in the basic tools of learning such as reading writing and computation, and learn to adjust himself to his surroundings through an elementary study of his physical and social environment. He should participate in activities which develop his constructive and creative skills and teach him the habits of healthy living. In order that a sound foundation in the mother-tongue may be laid at this stage, no language other than this should be introduced during the first four years. The curriculum of these classes should be gradually expanded and developed in keeping with the child's growth and development.

8.16. At the higher primary stage (Classes V–VII) the study of a second language will be added to that of the mother-tongue, arithmetic skill will develop into the acquisition of more difficult mathematical knowledge, environmental activities will lead to the study of natural and physical sciences, history, geography and civics, constructive and creative skills will provide the basis for the practice of simple arts and crafts, and the practice of healthy living will serve as the foundation for physical education.

8.17. The curriculum at the secondary stage should meet the needs of the adolescent as well as the needs of the democratic society in which he is expected to participate as a citizen on reaching maturity. The needs of democratic citizenship will require the development of certain skills, attitudes and qualities of character such as the capacity for clear thinking, the ability to communicate easily with one's fellowmen, the scientific attitude of mind, a sense of true patriotism and an appreciation of the value of productive work. The secondary school curriculum should contain the necessary educational elements for the cultivation of these habits, attitudes and qualities. The needs of adolescence are related not only to the acquisition of knowledge and the promotion of intellectual ability but the fuller development of the physical, emotional, aesthetic and moral aspects of the pupil's personality. Provision has, therefore, to be made in the curriculum on a more systematic scale than before, for programmes of physical education and subjects like art, craft, music, dancing and education in moral and spiritual values.

8.18. We give below what we believe should be the broad areas of curricular studies for the different sub-stages, and shall follow this outline with a discussion of the special features of the curriculum at each sub-stage.

(1) *Lower Primary Stage (Classes I-IV)*
  (a) One language—the mother-tongue or the regional language.
  (b) Mathematics.
  (c) Study of the Environment (covering Science and Social Studies in Classes III and IV).
  (d) Creative Activities.
  (e) Work-experience and Social Service.
  (f) Health Education.

(2) *Higher Primary Stage (Classes V-VII)*
  (a) Two languages—(i) the mother-tongue or the regional language, and (ii) Hindi or English.
  (*Note*: A third language (English, Hindi or the regional language) may be studied on an optional basis.
  (b) Mathematics.
  (c) Science.
  (d) Social Studies (or History, Geography and Civics).

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(e) Art.

(f) Work-experience and Social Service.

(g) Physical Education.

(h) Education in Moral and Spiritual Values.

(3) *Lower Secondary Stage (Classes VIII—X)*

(a) Three languages. In non-Hindi speaking areas, these languages will normally be (i) the mother-tongue or the regional language, (ii) Hindi at a higher or lower level, (iii) English at a higher or lower level. In Hindi speaking areas, they will normally be (i) the mother-tongue or the regional language, (ii) English (or Hindi, if English has already been taken as the mother-tongue), and (iii) a modern Indian language other than Hindi.

(*Note*: A classical language may be studied in addition to the above three languages on an optional basis).

(b) Mathematics.

(c) Science.

(d) History, Geography and Civics.

(e) Art.

(f) Work-experience and Social Service.

(g) Physical Education.

(h) Education in Moral and Spiritual Values.

8.19. **Curriculum at the Lower Primary Stage.** We have already suggested in an earlier chapter[1] that the first two classes of the primary school should be graded as a single unit, and wherever possible, this arrangement should be extended to cover Classes III and IV. The proposed curriculum for these classes is very simple and reduces the load of formal subjects. Only language and elementary mathematics are to be specially emphasized with a view to developing the basic tools of learning. The study of the environment will be largely informal in the beginning and will be provided by making the child observe his immediate social and physical surroundings and talk in class about what he observes. In Class III environmental studies will gradually lead to social studies and science which may now be treated as regular subjects, but in a very elementary manner. While the activity method will permeate all teaching, special activities in the form of music, art work, dramatics and handwork should be organized for creative self-expression. Health education will stress the formation of good health habits. Work-experience will consist largely of handwork and social service will involve simple activities like cleaning the classroom, decorating the school, etc.

8.20. We would like to emphasize one important aspect of education at this stage, *viz.*, reading with understanding. If proper foundations for this are not laid at this level, the entire future education of the child will receive an irreparable set-back. Adequate attention has not been paid so far to research in beginning reading, to the evolution of proper methods of teaching reading to young children with phonetic scripts which the Indian languages have, to the preparation of graded vocabularies, to the designing of primers and readers for Class I and to the evolution of tests of reading readiness or competence. It has not yet been possible to organize the proper training of teacher-educators at the primary level in these matters, and the average primary teacher generally tries to teach reading in a rule-of-thumb manner. It is the neglect of this crucial area that is responsible for a good deal of the stagnation at the lower primary stage. We recommend that a study of these problems should be taken up in earnest and that a vigorous programme of improving reading instruction at the lower primary stage should be developed in all parts of the country.

8.21. **Curriculum at the Higher Primary Stage.** When the pupil enters the higher primary stage, learning will become more systematic with greater stress on discrete subjects. The curriculum will broaden in respect of subject-coverage and deepen in respect of content. Teaching methods will become more systematic and standards of attainment more specific and definite than before.

8.22. A second language, either Hindi or English has now to be introduced so that a working knowledge in one of the two link languages may be attained by the end of Class VII. While only two languages will be compulsory at this stage, a pupil may study three languages—the regional language, English and Hindi—if he so desires, and facilities will have to be provided for the teaching of the third language in every school. Mathematics and science will receive greater stress than before. Social studies may continue as an integrated course if competent teachers and the requisite facilities are available; otherwise the study of history, geography, and civics should be taken up as separate disciplines. Arts and crafts will figure more prominently, the latter as a part of work-experience, and physical education and games will have their due place. A period or two a week should be allotted to education in moral and spiritual values in an organized attempt to develop the character of the pupils and inculcate in them a respect for religions other than their own. Social service activities will now include participation in the life of the local community.

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8.23. **Curriculum at the Lower Secondary Stage.** The subjects that were studied in Classes V, VI and VII will be continued at the lower secondary stage; but with the increasing maturity of the students, their study has to gain in rigour and depth. Subject competence in science is particularly important in view of the phenomenal advances made in recent years in scientific knowledge, history, geography and civics; and present-day problems will be taught separately with such correlation as is natural and necessary. A third language—Hindi or English or a modern Indian language—will be introduced here on a compulsory basis. Work-experience will be organized, as far as possible, on a farm, workshop or other production unit; social service will be undertaken continuously for a fixed period every year; and education in moral and spiritual values will be provided on a more systematic basis.

8.24. **Curriculum at the Higher Secondary Stage.** After the completion of the first ten years of schooling leading to the high school examination, the special interests and abilities of the student will have been generally formed, and, with a good system of guidance and counselling, he can be helped in the choice of his future career and educational course. An extensive and varied programme of vocational education should be provided at this stage. In the light of the proposed enrolment policies discussed in the preceding chapter, 50 per cent of those who wish to continue their studies beyond Class X are expected to take up full-time or part-time vocational courses and 50 per cent will be in courses of general education. The latter type of courses will be diversified to enable the students to select for special study a group of any three subjects based on the work already done at the lower secondary stage. As in the existing higher secondary scheme, the primary object of the new diversification is to provide opportunities in the last two years of schooling for the development of the special academic interests of the students.

8.25. But there are two important differences between the new scheme and the old one. The first is that, since the technical, commercial and agricultural courses and probably also the courses in fine arts and home science, will in future be studied, generally speaking, in special vocational institutions, the present seven categories of elective subjects will in effect be reduced to arts and sciences. The second is that there will be no sharp distinction even between these two categories and there will be no streaming of subjects on the prevailing pattern, in which a student is compelled to take his three electives from only one group in the form of a package deal, as it were, and cannot combine an elective from one group with optional subjects from another. While a student specially interested in science will normally opt for three science subjects such as physics, chemistry and mathematics, or physics, chemistry and biology, he should not be debarred from taking, if he so desires, a subject like psychology or logic along with physics and mathematics. Similarly, though a student who is keen on taking special courses in arts may select all the three subjects from this group, such as English, history and geography, he should not be prevented from combining, if he so desires, a subject like biology along with English and history. It will thus be seen that, while the changes proposed in the existing higher secondary scheme restrict the wide range of optional courses at present permitted in Class IX, X and XI, they provide for greater freedom and elasticity in the grouping of subjects within the limited range in the new Classes XI and XII. As the education imparted in the higher secondary classes will lead in most cases to university studies, the subjects in arts and sciences with the elastic groupings that we have recommended above will meet the needs of most students.

8.26. In addition to the three elective subjects, a student should select for further study any two languages. These may be two of the three languages studied by him at the lower secondary stage, but these may also include any modern Indian language other than the one taken previously or any foreign language or any classical language The normal combination for the majority of students, as far as the two compulsory languages are concerned, will probably be Hindi or the regional language and English. But we do not wish to recommend any particular grouping in this case The combination should be left to the choice of the student which, of course, will be determined by the facilities for language study provided in the higher secondary school he has joined. In Chapter II we have stressed the importance of promoting in every linguistic region the study of modern Indian languages other than the language of the region. We have also recommended that a few carefully selected schools could provide for the study of foreign languages other than English, and particularly of Russian. At the higher secondary stage, some good schools would like to make such provision in their courses of studies; and they should be encouraged in their efforts to strike out a new path in the language curriculum.

8.27. We have referred above to the need for attending to the development of the physical, aesthetic and moral aspects of the adolescent's personality. The need is perhaps even greater at the higher secondary stage than in the early years of adolescence. With the narrowing down of the curriculum range to five academic subjects and the specialised study of three of these subjects demanding greater time and more intensive study, it becomes all the more necessary to include a complementary element in the curriculum which will effectively contribute to the full development of the student's personality. Provision must be made here, as at the lower secondary stage, for work-experience and social service, for arts and crafts, for physical education including games and sports, and for education in moral and spiritual values. In our discussion of curricular problems we have not suggested any allocations of time for different subjects at any stage. But we would like to depart from this procedure in the case of the higher secondary stage. As there is a danger of the specialist subjects making heavy demands on the time-table, we suggest that about one half of the instructional time should be devoted to the three electives, one-fourth to the study of the two languages and one-fourth to the complementary activities or subjects referred to above.

8.28. **Subject Areas in the Higher Secondary Course.** The existing one-year higher secondary course will soon have to be reorganized to cover a two-year period. We give below a list of subject areas which, we think, should form part of the curriculum. But this list is only suggestive. The whole question of the higher secondary curriculum will have to be carefully examined and the details worked out by an expert body consisting of representatives of the universities, State Boards of School Education, and State Departments of Eduation.

(1) Any two languages, including any modern Indian language, any modern foreign language and any classical language.

(2) Any three subjects from the following:

(a) An additional language.
(b) History.
(c) Geography.
(d) Economics.
(e) Logic.
(f) Psychology.
(g) Sociology.
(h) Art.
(i) Physics.
(j) Chemistry.
(k) Mathematics.
(l) Biology.
(m) Geology.
(n) Home Science.

(3) Work-experiene and Social Service.

(4) Physical Education.

(5) Art or Craft.

(6) Education in Moral and Spiritual Values.

8.29. **Advanced and Enrichment Programmes at Different Stages.** In the preceding section we suggested that the State Education Departments should prepare advanced courses in the different school subjects and that good schools should adopt these courses by introducing the changes in one or two subjects in the beginning and gradually covering the entire school curriculum in a phased programme suited to their convenience. Even where it is not possible for a school to adopt an advanced course in a subject for all its pupils in a particular class, it can give the benefit of such a course to the gifted children. In other words, a good school can have two kinds of curricula at a particular stage or even in a particular class—one being the common curriculum for the pupils who are average in ability, and the other being an advanced curriculum for the very bright pupils. In this context, we make the following recommendations:

(1) At the primary stage, it is difficult to provide separate advanced courses. Enrichment programmes should, therefore, be created for talented children, so that they may get more challenging and more satisfying learning experiences from their studies. Such programmes may start in Class V or VI. It may, for instance, be in the form of additional science, which may involve more extensive reading, practical work and application of knowledge to life situations. It may also mean additional work in language or art, leading to the development of creative self-expression. It is better if the planning of the enrichment programme is done by teachers and pupils together. General guidelines can be given in the curriculum materials, and the teacher will also need some additional help in the form of special types of work-books and facilities for the establishment of subject clubs. Work under this programme may be done also outside the school hours.

(2) At the secondary stage, we are not in favour of diversified courses. But we strongly recommend the organization of courses at two levels—ordinary and advanced—beginning with Class VIII. Advanced courses may be offered in various subjects and should be included in the curriculum on an optional basis. In the lower secondary classes, a beginning may be made with advanced courses in mathematics, science and the languages. But at the higher secondary stage, such courses should be provided in all the specialised subjects. A student appearing for the higher secondary school examination should not normally offer advanced courses in more than two subjects. Different arrangements will have to be made by schools for the organization of advanced courses such as regular instruction during the school hours (in large schools with many class divisions), instruction outside the school hours, and self-study by students under the teacher's guidance, depending upon the circumstances of the case.

LANGUAGES

8.30. We shall now consider the special features of the various subject areas or areas of educational activity which, in our opinion, should form part of the school curriculum at different stages. We shall take up for discussion only those aspects which need to be highlighted with particular reference to our national and educational goals as well as the specific objectives of school education.

8.31. **Origin of the Three-Language Formula.** The Central Advisory Board of Education in 1956 examined at length the complex problem of the teaching of the languages in relation to the needs of the country and the requirements of the Constitution. It devised a formula known as the 'Three-Language Formula' which was somewhat simplified, and approved by the Conference of Chief Ministers held in 1961. The impelling considerations were more political and social, than educational. In effect, the formula established equality with regard to the study of languages between the Hindi and the non-Hindi areas by recommending that, as against the third language, Hindi, which pupils in the non-Hindi areas have to learn, another Indian language (besides Hindi and English) should be studied by pupils in the Hindi areas.

8.32. **Difficulties in Implementing the Formula.** In practice, the implementation of the three-language formula has led to several difficulties and it has not been very successful. Several factors have contributed to this situation. Among these are the general opposition to a heavy language load in the school curriculum; the lack of motivation for the study of an additional modern Indian language in the Hindi areas; the resistance to the study of Hindi in some non-Hindi areas; and the heavy cost and effort involved in providing for the teaching of the second and the third languages for five to six years (from Class VI to Class X or XI). The situation was made worse by defective planning and by the half-hearted way in which the formula was implemented. As a result of these developments, considerable resources have been wasted over what may be regarded as an unproductive programme of implementation. As far as the third language is concerned, the students in many areas have gained very little because of the unreal situation in which most of them studied it and the inadequate facilities that were provided for the purpose. The time has now come for a review of the entire situation, and the formulation of a new policy with regard to language study at the school stage, particularly in view of the fact that English has been recognized as an associate official language of the Indian Union for an indefinite period.

8.33. **Basis for a Workable Three-Language Formula.** The following guiding principles would help in evolving a *workable* three-language formula in schools:

(1) Hindi is the official language of the Union and is expected in due course of time to become the *lingua franca* of the country. Its ultimate importance in the language curriculum will be second only to that of the mother-tongue.

(2) English will continue to enjoy a high status so long as it remains the principal medium of education at the university stage, and the language of administration at the Centre and in many of the States. Even after the regional languages become media in higher education in the universities, a working knowledge of English will be a valuable asset for all students and a reasonable proficiency in the language will be necessary for those who proceed to the university.

(3) The degree of proficiency that can be acquired in learning a language at school depends not only on the number of years during which it is learnt but also on the motivation of the student, the stage at which it is studied, the types of teachers and equipment provided and the methods of teaching adopted. A short period under favourable conditions might achieve better results than a longer period without proper facilities. While arguments can be advanced for introducing a child to a second language at a very early age, the provision of qualified and competent teachers for teaching the language to millions of children in our primary schools would be a very formidable task.

(4) The most suitable stage for making the learning of three languages compulsory appears to be the lower secondary stage (Classes VIII-X), where smaller numbers of pupils are involved and better facilities and teaching personnel can be provided. It is also desirable to stagger the introduction of two additional languages so that one is started at the higher primary stage and the other at the lower secondary stage, after the first additional language has been mastered to some extent. In a good school, three years of compulsory study would probably be adequate for gaining a working knowledge of the third language; but arrangements should be made for its study for a longer period on an optional basis.

(5) The stage at which Hindi or English should be introduced on a compulsory basis as a second language and the period for which it should be taught will depend on local motivation and need, and should be left to the discretion of each State.

(6) At no stage should the learning of four languages be made compulsory, but provision should be available for the study of four or even more languages on a voluntary basis.

8.34. We, therefore, recommend a modified or graduated three-language formula to include:

(1) The mother-tongue or the regional language;
(2) The official language of the Union or the associate official language of the Union so long as it exists; and
(3) A modern Indian or foreign language not covered under (1) and (2) and other than that used as the medium of instruction.

8.35. **Implications of the Modified Formula.** At the lower primary stage only one language should be studied compulsorily—the mother-tongue or the regional language, at the option of the pupil. In the case of the vast majority of pupils, the language of study at this stage will be the regional language which will also be their mother-tongue. Some children belonging to the linguistic minorities may also opt for instruction in the regional language, because of its great advantages; but this cannot be forced on them, and they have the right under the Constitution to have facilities provided for their primary education through their mother-tongues. The State governments should, therefore, provide primary schools teaching through the mother-tongue for the children of linguistic minorities if they desire to have such an education, subject to the usual condition approved by the Education Ministers' Conference (1949) that the minimum number of such children should be 10 in a class or 40 in a school. It is desirable that such children should have a working knowledge of the regional language also. Facilities for its study should, therefore, be provided, on an optional basis, from Class III onwards. We do not favour making the study of regional language compulsory at this stage for children of linguistic minorities, as has been done in some States at present. We also are not in favour of teaching English as a second language at this stage. This has been discussed further in a later section.

8.36. At the higher primary stage only two languages should be studied on a compulsory basis: (1) the mother-tongue or the regional language, and (2) the official or the associate official language of the Union. For almost all the pupils in the Hindi areas and for a majority of them in the non-Hindi areas, English will probably be the second language, but a large proportion of the pupils in non-Hindi areas may also opt for Hindi. In addition, facilities should be provided for the study of a third language on an optional basis, so that the children in Hindi areas whose mother-tongue is not Hindi and the children in non-Hindi areas who have taken English as the second language may study the official language of the Union, if they so desire.

8.37. At the lower secondary stage (Classes VIII—X), a study of three languages should be obligatory; and a student should be under an obligation to study either the official language of the Union or the associate official language which he had *not* elected at the higher primary stage. By and large, the pupils in the Hindi areas will study Hindi, English and a modern Indian language, while the vast majority of pupils in non-Hindi areas will learn the regional language, Hindi and English. In the selection of the modern Indian language in Hindi speaking areas, the criterion should be the motivation of the pupils for studying that language. For instance, in the border areas of a State, people are generally interested in studying the regional language across the border and this could well be the third language to be studied.

8.38. It is true that English will be the most important library language to be studied at this stage. We, however, think that it is also necessary to encourage the study of other important library languages like Russian, German, French, Spanish, Chinese or Japanese. Facilities for their study should be provided in a few selected schools in each State and it should be open to the students to study them, either in addition to, or in lieu of English or Hindi. Similarly, provision should be made, in a few selected schools in the non-Hindi areas, for the study of modern Indian languages other than Hindi and the regional language. It should be open to the students to study these languages, as stated earlier with regard to library languages, either in addition to or in lieu of English or Hindi.

8.39. In the higher secondary classes, which will serve largely as a preparatory stage for higher education, only two languages need be made compulsory and the students should have the option to select any two of the three languages studied earlier or a combination of any two languages taken from the following groups: (1) modern Indian languages; (2) modern foreign languages; (3) classical languages—Indian and foreign. There is of course no bar to a student studying one or more additional languages on an optional basis.

8.40. **Position of the Official Languages in the Formula.** The three-language formula as modified above is elastic and more likely to meet the varied linguistic needs of the people than the rigid approaches which are commonly adopted. For instance:

(1) The study of English and Hindi in our proposal, would be indicated, not in terms of years of study, but in terms of hours of study and the level of attainment. There would be two prescribed levels of attainment in each of these languages—one for those who study it for a period of three years and the other for those who study it for a period of six years.

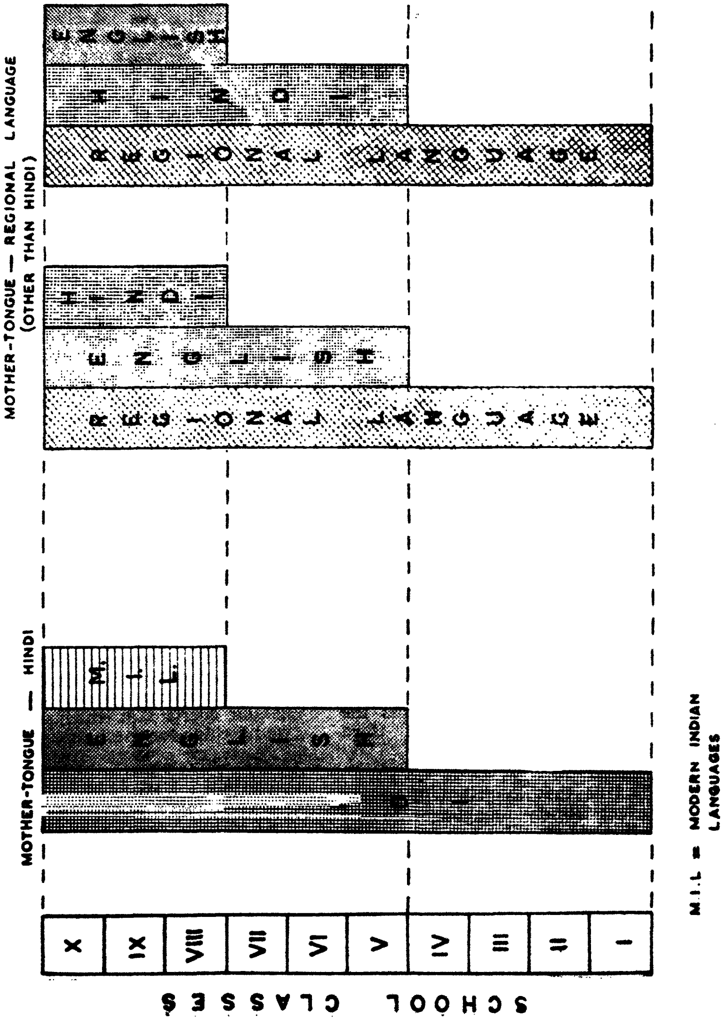
(2) For most children completing lower secondary stage, two of the three languages learnt will be Hindi and English—the two link languages of the country which function as instruments of national and social integration. Some need only a working knowledge of Hindi or English, while others require a greater proficiency in them. The flexible curriculum which we have proposed would cater for these separate needs.

(3) Although English would be the most important library language to be studied, a certain number of students will study a library language other than English in all parts of the country.

(4) In every linguistic region, there will be a certain number of students studying other modern Indian languages and thereby opening up multiple channels of internal communication.

Our proposals have been shown graphically in the chart on page 194. This elastic approach to the language problem, it is hoped, will promote a better cultural communication between the different linguistic groups in the country and promote a better international understanding.

THE STUDY OF LANGUAGES AT SCHOOL (CLASSES I-X)



8.41. **Views of Kumari S. Panandikar.** While agreeing broadly with the above proposals, our colleague, Kumari S. Panandikar, holds a different view on the three-language formula as applied to the higher primary stage. She observes:

> In my opinion, a study of three languages should be obligatory not only at the lower secondary stage as recommended by the majority of the members of the Commission, but at a stage lower, that is at the higher primary stage, and these three languages should be the mother-tongue, Hindi and English in the non-Hindi speaking areas, and the mother-tongue, a modern Indian language and English in the Hindi speaking areas.
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> If Hindi is not merely to be the official language of the Union, but is to be a common link national language in the whole country, it is desirable to provide for its study during the compulsory stage of education, so that those who do not continue their education beyond this stage will have had an opportunity to study it for three years. The same can be said of English, which apart from being the associate language of the Union, is a world language, introducing a person to the terminology and contents of knowledge that is developing in the modern world.
>
> An early study of languages is desirable because it facilitates language learning, from the point of view of expression as well as comprehension, and leads to better retention. The study of two additional languages, if begun at this stage, is not likely to be a heavy burden. Pupils of this age, 11 to 14, are interested in studying languages and such a study helps their mental development by giving them a sense of precision and accuracy which is helpful in all their study. The study of three languages in all need not lead to an impoverishment of content or knowledge, as is often feared, if care is taken to see that subject-matter of different types is introduced through each of the languages.
>
> A good teacher can always succeed in creating motivation for learning any language. As regards Hindi, there is enough motivation in the environment even in rural areas in the non-Hindi speaking regions. The radio and/or the cinema, with their use of Hindi, have reached these areas and people are familiar with Hindi as a medium of communication. Increasing opportunities for travel have also made Hindi a part of one's life For the study of English also there is no lack of motivation in these areas. English picture books of various kinds, signboards and notices provoke the natural curiosity to read and understand English. In the Hindi speaking areas there can be a natural desire to learn a modern Indian language either because one's neighbours and friends speak that language as their own or because writers like Rabindranath Tagore or some other children's writers have written in that language. The study of Hindi in non-Hindi speaking areas or of a modern Indian language in Hindi-speaking areas will help in promoting mutual understanding and national integration in an effective manner. The right climate can be created for it, if language learning is looked upon as an opportunity and not as a load or a burden imposed on one. A notable example is that of the Scandinavian countries where the study of languages is taken up with a great zeal and enthusiasm and children and adults are proud of their achievement in three or four languages.
>
> If the study of additional two languages is begun at the higher primary stage—one language in its purely conversational form being introduced a year earlier if it is necessary to avoid introducing the second language in the same year—and continued for three years, the period given to their study at later stages could be reduced and adjusted according to the needs of the students. At the lower secondary stage, for the age group 14-16, when the knowledge of content subjects such as natural and the social sciences assume special importance, it is desirable that an introduction to a third language on a compulsory basis does not take place at this stage and interfere with the study of content subjects.
>
> It is realized that there may be some difficulty in getting properly trained teachers to teach the two additional languages at the higher primary stage. This difficulty is likely to be more acute in the case of teachers of English than of Hindi or modern Indian languages. If educationally and from the point of view of social cohesion the introduction of these languages at this stage is considered to be essential, strenuous efforts will have to be made to prepare teachers to teach English, Hindi and modern Indian languages.

We are in entire agreement with our colleague that Hindi should attain the position of a link language for the entire country as quickly as possible. Our differences, therefore, relate, not to the ends, but to the means We are of the view that both in the general interest of education as well as for the rapid and effective promotion of Hindi as a link language, the approach suggested above by us is perhaps the most suitable and appropriate.

We do not also agree with our colleague when she opines that a teacher can create motivation for any child, at any stage, and in any situation, to study any language. Creating motivation for the study of a language is a complex social process which depends more on social and economic factors outside the school than on the academic programmes of the school itself. The motivation for the study of Hindi in non-Hindi areas will have to be created by giving to Hindi a larger place in social life and administration and by producing good books in Hindi. Given time and intensive effort, it is possible to succeed in this endeavour. But it is extremely difficult to create a similar motivation for the study of a modern Indian language in the Hindi areas. Especially at the primary stage, language learning can be a big burden on a child if it is imposed; and such imposition can vitiate his entire attitude towards his studies and may generate hostility to the school itself. This would indeed be a tragedy at a time when our chief objective is to win the masses over to education.

We strongly feel that the study of three languages at the elementary stage will interfere considerably with the development of the child's mastery over his mother-tongue and with his intellectual growth. Even in the educationally advanced countries, the reading ability of children in slum schools may be 2-3 years behind that of children in the average schools. This feature is likely to be even more accentuated in our country. In the immediate future, therefore, the greatest emphasis should be placed on the learning of one's own language, and the study of additional languages has to be kept at the minimum. At the secondary stage, however, the situation changes materially. The student has by now been won over to education and has generally become mature enough to undertake the study of subjects for which motivation need not be very strong. A compulsory study of languages or a heavier language load can, therefore, do comparatively less harm at this stage. That is why we have recommended the compulsory study of three languages at this stage.

International comparisons have to be used carefully in this context. A special note on the subject is given at the end of this chapter.[1] It will be seen that while there are countries which provide for a study of two or more languages at the secondary stage, nowhere is a study of three languages made compulsory at the elementary stage. We are thus trying to do a most difficult task at the most inopportune moment in our educational history. Today, the basic issue we have to face in primary education is to teach the mother-tongue well and to eradicate illiteracy; and the learning of additional languages is a costly and difficult load which the education system is ill-equipped to bear. Even in the industrially advanced countries, the whole course of primary education used to be based on the study of one langauge only. It is only when their education developed and economy became affluent that they introduced a second language at the primary stage. But even under the best of circumstances, there is hardly any example of an educational system which has introduced a study of three languages, on a compulsory basis, at the primary stage. It must be realised that we are trying to do what even advanced educational systems and affluent economies have not done and that we are creating insuperable difficulties for our progress by the needless self-imposition of a heavy language load on a nascent system of primary education.

8.42. **Three-Language Formula at the University Stage.** There has been a suggestion that the three-language formula should be extended to the university stage also. In our opinion, this would place a heavy language load on students and lead to a waste of scarce resources and deterioration of standards of subject knowledge in higher education. As we have stated earlier, the study of two languages only should be compulsory at the higher secondary stage. In higher education, the study of a language should not be compulsory.

8.43. **Study of Hindi.** Although in the modified three-language formula recommended by us, a certain proportion of students may not study Hindi as a second or third language, beyond a period of three years, we would like to lay the utmost stress on the importance of the study of the language and the necessity of organizing a nation-wide programme for promoting such study on a voluntary basis. As Hindi is the link language among the masses, it is necessary that every person should have at least a working knowledge of Hindi as a channel of internal communication in all parts of India and that those who will have to use it as the official language either at the Centre or in the States acquire a much higher proficiency in it. But in our opinion, the cause of Hindi, and also of national integration, would be better served if its study beyond a certain point is not forced on unwilling sections of the people. We have no doubt that boys and girls will study Hindi more intensively if there is adequate motivation. This motivation largely depends on the extent to which Hindi becomes in effect a language of administration. It is also related to the manner in which Hindi develops and becomes enriched so that people in non-Hindi areas may turn to it for knowledge and cultural nourishment.

8.44. The burden of studying languages becomes all the greater because of the differences in script. Very often a student is required to study, not only three languages, but three scripts. The solution to this problem—and many others allied to it—would be greatly facilitated if a common script—either Roman or Devanagari—were to be adopted for all modern Indian languages. Unfortunately, there is no agreement on the issue. But in our opinion, the ultimate solution of the problem would be facilitated if we start producing some literature in every modern Indian language written in both the scripts—Devanagari and Roman. This process can begin in the study of the third language at the school stage, when it happens to be a modern Indian language. It would be extremely convenient to begin the study of the third language by using a script already known to the student—Devanagari or Roman. For instance, students in Hindi areas beginning to learn Bengali or Tamil may use the Devnagari or Roman script for it. Students of Hindi in non-Hindi areas may begin to learn Hindi in the script of their mother-tongue or in Roman. The proper script of the language may be taught later, after the student has mastered the language to a certain extent and been adequately motivated.

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[1] See Supplementary Note III.

8.45. The numerals now taught in schools vary from language to language. We recommend that all modern Indian languages should adopt the international numerals which, in a way, are really Indian in origin. This is a simple reform which will lead to great convenience.

8.46. **Study of English.** As English will, for a long time to come, continue to be needed as a 'library language' in the field of higher education, a strong foundation in the language will have to be laid at the school stage. We have recommended that its teaching may begin in Class V, but we realize that for many pupils, particularly in the rural areas, the study will not commence before Class VIII. The fact that English will be for the overwhelming majority of pupils only a second or a third language makes it all the more necessary to ensure the adoption of effective modern methods of teaching the language by teachers who have been specially trained for the purpose. In this connection we would like to refer to a recent report[1] on the study of English submitted to the Ministry of Education by a group of specialists in the subject. The group has supported the teaching of English on the basis of the structural approach, which is now being used increasingly in different parts of India, and has suggested a detailed syllabus for the study of the language from Class V to Class XII, both at the ordinary and at the advanced levels. We endorse the many useful recommendations made in this report.

8.47. The group has also expressed the view that the policy recently adopted by several States of introducing the study of English in Class III is educationally unsound. We agree with this view. We believe that an adequate command over the mother-tongue should be acquired before the learning of a foreign language like English is begun. Moreover, the effective teaching of English in the lower primary classes, where millions of pupils are enrolled, requires a very large number of trained teachers who are not available. Even if they were, the programme will be a heavy drain on the funds allotted for education. In our opinion, this is a colossal task, the improper pursuit of which will lower rather than upgrade the standards of English at the school stage. We, therefore, recommend that the study of English as a foreign language, except on an experimental basis in certain schools, should not begin before Class V.

8.48. **Study of Classical Languages.** We recognize the importance of the study of classical languages and of the special claim that Sanskrit has on the national system of education. But we do not agree with the proposal to include Sanskrit or other classical languages in the three-language formula. In our opinion, this formula has to be restricted to the modern Indian languages only. We are in favour of the proposal of adopting a combined course of the mother-tongue and Sanskrit. But this is not a very popular proposal. Under these circumstances, classical languages can be provided in the school curriculum on an optional basis only. This may be done from Class VIII onwards.

8.49. We cannot also support the idea of Sanskrit universities. We would, instead, commend an emphasis on the study of Sanskrit and other classical languages in all universities and the establishment of advanced centres of study in these languages in some of our important universities. We suggest that no new Sanskrit university should be established.

SCIENCE AND MATHEMATICS

8.50. We lay great emphasis on making science an important element in the school curriculum. We, therefore, recommend that science and mathematics should be taught on a compulsory basis to all pupils as a part of general education during the first ten years of schooling. In addition, there should be provision of special courses in these subjects at the secondary stage, for students of more than average ability. This programme can become meaningful and useful only if the science curricula are reorganized and brought up-to-date, the methods of teaching are vitalized and proper facilities are provided for the teaching of the subject.

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[1] *The Study of English in India*, Report of the Study Group appointed by the Ministry of Education, Government of India, 1964.

8.51. **Science in the Primary School.** The aims of teaching science in the primary school should be to develop proper understanding of the main facts, concepts, principles and processes in the physical and biological environment. Both deductive and inductive approaches should be utilized to unravel these ideas, though more emphasis may be laid on the deductive approach or the use of the scientific method.

8.52. In the lower primary classes, the focus should be on the child's environment —social, physical and biological. In Classes I and II, the accent should be on cleanliness, formation of healthy habits and development of the power of observation. These should be emphasized again in Classes III and IV, but the study should include personal hygiene and sanitation. The child may also be introduced to formal areas of science such as the plants and animals in his surroundings, the air he breathes, the water he drinks, the weather that affects his daily life, the earth he lives on, the simple machines that are being used in his environment, the body of which he should take care and the heavenly bodies he looks on at night. School gardening is an activity that should be encouraged especially at this stage, as it provides pupils with direct and valuable experiences of natural phenomena.

8.53. We also recommend that in Class IV, children should be taught the Roman alphabet. This is essential as the internationally accepted symbols for the units of scientific measurement and symbols for chemical elements and compounds are written in the Roman alphabet. Whatever one's language and the word for water, the chemical symbol for it is always H_2O. And it is far more than a symbol, it provides an insight about the nature of water. Again, a knowledge of the Roman alphabet makes possible the use of maps, charts and statistical tables on an international scale. How expensive and time consuming it will be to make available this material in all the local languages!

8.54. At the higher primary stage, the emphasis may shift to the acquisition of knowledge together with the ability to think logically, to draw conclusions and to make decisions at a higher level. Science should now be taught as physics, chemistry, biology, geology and astronomy. The allocation of these subjects among the three classes is suggested below; but other combinations may be tried depending upon the level of the students and local conditions:

Class V Physics, Geology, Biology.

Class VI Physics, Chemistry, Biology.

Class VII Physics, Biology, Chemistry, Astronomy.

8.55. The general science approach to the teaching of science which has been widely adopted at the elementary stage during the last ten years has not proved successful as it tends to make science appear somewhat formless and without structure and runs counter to its methodology. A disciplinary approach to science learning would, it is felt, be more effective in providing the necessary scientific base to young people. The introduction of astronomy is specially commended, as it plays an important part in imparting good science education and in developing a rational outlook. From Class V onwards the Indian almanac should be studied by observation of the night sky.

8.56. Every primary school should have a science corner or a room to keep specimens, models and charts with the necessary storage facilities. A minimum of one laboratory-cum-lecture room should be provided in every higher primary school.

8.57. **Science in the Secondary School.** At the secondary level, science as a discipline of the mind and a preparation for higher education deserves special emphasis. In the lower secondary classes, physics, chemistry, biology and earth sciences should be taught as compulsory subjects for all the pupils. Building on the introductory courses at the earlier stage, they should be made to cover wider areas and go deeper into the content than before. The changing character of the sciences should be the major factor in curriculum development.

8.58. **Features of the Secondary School Science Curriculum.** During the last few decades, the conceptual framework of physics has undergone a drastic change and this should be reflected in the high school physics curriculum. Similarly in chemistry, the stress hitherto laid on memorisation of facts, formulae, processes and compounds should give place to an emphasis on the unifying concepts in the subject. It is necessary to highlight the applications of chemistry in industry and daily life and its growing importance in our developing economy. Again, the present content of the school course in biology is traditional in nature. The concept of biology as a method of inquiry by means of accurate and confirmable observations, quantitatively and mathematically analysed, and controlled experimentation should be impressed on the minds of the young learners. Earth sciences should be introduced in the secondary school, geology and geography being taught as an integrated subject. There are also many areas in chemistry, physics and biology to which certain topics in the study of earth sciences can be naturally related.

8.59. **Science at the Higher Secondary Stage.** At the higher secondary stage where diversification of studies will take place, science will not be studied on a compulsory basis by all the students. Those who opt for specialization in the subject may take all the three electives from the science group consisting of physics, chemistry, biology, geology and mathematics. But, as has been explained earlier, we are not in favour of rigid groupings and a science biased course can provide for a combination of two science subjects like physics and chemistry with an arts subject like economics. Similarly it is possible for an arts student to take up the study of physics or biology or any of the other subjects in the science group as an elective. Such flexibility in the curriculum will not only help to prevent narrow specialization, but will also make it possible to extend the benefit of the systematic teaching of science at the higher secondary stage to a much larger number of students.

8.60. We have already recommended the provision of courses in science at a higher level for the talented students. Such courses may begin at the lower secondary stage in selected schools which have adequate staff and laboratory facilities. It would be worthwhile to have a few secondary schools attached to some of the universities for the purpose of experimenting with a dynamic school programme under the supervision and guidance of the university faculty. Such schools may either be 'adopted' from among the good schools in the locality or be specially established for this purpose.

8.61. **Science in Rural and Urban Schools.** In secondary schools in the rural areas, the linking of education to the agricultural environment can be done through integrated courses which bring out the impact of the physical sciences on biology. In view of the need to apply science and technology to Indian agriculture, it will also be desirable to introduce gradually the pupils in rural secondary schools to the ideas and practices of scientific farming and the activities and skills related to it. Similarly, in schools in industrialized areas, the curricula should have a bias towards the technical and industrial aspects of experimental science and its impact on industrialization. The levels to be attained in the rural and urban schools should be the same and avenues to higher education should be available to students from both types of schools without discrimination.

8.62. **Study of Mathematics.** One of the outstanding characteristics of scientific culture is quantification. Mathematics, therefore, assumes a prominent position in modern education. Apart from its role in the growth of the physical sciences, it is now playing an increasingly important part in the development of the biological sciences. The advent of automation and cybernetics in this century marks the beginning of the new scientific-industrial revolution and makes it all the more imperative to devote special attention to the study of mathematics. Proper foundations in the knowledge of the subject should be laid at school.

8.63. **Mathematics Syllabus at Different Stages.** At the primary stage, mathematics is at present divided into arithmetic, algebra and geometry. This involves unnecessary repetition in teaching fundamental operations with numbers. It is, therefore, most desirable that the course in arithmetic and algebra be integrated and emphasis placed on the laws and principles of mathematics and logical thinking. The syllabus should include development of the number system, systems of numeration and notation, equations, graphs and functions. Similarly, the geometry course should be reorganized in a more rational manner.

8.64. At the secondary and higher secondary levels also, the mathematics syllabuses which at present are divided in the traditional manner into arithmetic, geometry and algebra, trigonometry, statistics, calculus and coordinate geometry, need to be revitalized and brought up-to-date. The entire arithmetic course and also the basic operations in algebra can be completed by the end of the primary stage. There is considerable room for eliminating out-dated material from the syllabus such as simplification, factorization, the finding of HCF, LCM, etc. Trigonometry should be related to algebra and may not be treated as a separate subject. Much of the work on identities, solution of triangles, heights and distances could be considerably cut down. The emphasis on memorising of theorems and exercises in geometry should be given up. The approach to the teaching of geometry should be changed and an axiomatic and systematic treatment adopted.

8.65. 'Set' language may be used in defining the basic terms in geometry and operations with numbers. It is only through the use of 'set' language that a proper integration of artihmetic, algebra and geometry is possible. The use of the School Mathematics Study Group[1] notations for line, segment, ray and so on, which provide for more precision in language, may be adopted.

8.66. **Methods of Teaching Science and Mathemetics.** We now proceed to discuss in brief certain specific suggestions for the improvement of the teaching of science and mathematics. These should be taken note of in any programme for raising the standards of science education in addition to the general suggestions for the improvement of classroom methods given above.

(1) The lecture method is the one most commonly employed in the science classroom, and even where lectures are followed by so called practical work, they do not help to develop a proper grasp of the subject matter. the necessary skill required for analysing and solving problems on the basis of scientific principles and data, or the right attitude towards the process or spirit of scientific inquiry. The preparation of textbooks, teachers' guides and instructional materials which emphasize the investigatory approach from the very beginning probably occupies an even higher priority in the teaching of science than in the teaching of any other subject.

(2) The close connection between science and agriculture and industry should be stressed even at the early stages. Demonstration experiments and laboratory investigations should reflect the agricultural and industrial interests of the local community. This would make science teaching more realistic to the pupils and also more interesting and useful.

(3) At the secondary stage, the teaching of science can be built round 'home technology' or the maintenance and study of gadgets commonly used at home, agricultural implements and industrial tools. The students can be oriented to experimental science by selecting topics from nature or human inventions.

(4) A weak feature in the present system of teaching is laboratory work, where the approach is confirmatory and not investigatory. Emphasis should now shift to the location of a problem, the development of hypotheses and the designing of procedures and experiments relating to theory. In view of the emphasis on laboratory work, the expenditure on laboratories will have to be stepped up considerably.

(5) Demonstration experiments performed by the teacher, or by selected students under the supervision of the teacher, should form an important and integral part of science teaching. There should also be provision for experiments to be performed by teams or groups of students.

(6) In the teaching of mathematics, emphasis should be more on the understanding of basic principles than on the mechanical teaching of mathematical computations.

(7) The modernization of mathematics teaching is vital to any programme of reform in school education. But the new curricula and the modern approach can be introduced into our schools only gradually. The pace in this matter will be determined by what can be done for the training of new mathematics teachers and the retraining of the teachers already in schools (through refresher and correspondence courses) and for the preparation of new text materials.

(8) Sufficient flexibility should be provided both in the courses of science and mathematics and in the methods of teaching these subjects to cater for the special and varying needs of gifted individuals at all stages of school education.

SOCIAL STUDIES AND SOCIAL SCIENCES

8.67. **Organizing the Syllabus in Different Ways.** The aim of teaching social studies is to help the students to acquire a knowledge of their environment, an understanding of human relationships and certain attitudes and values which are vital for intelligent participation in the affairs of the community, the State, the nation and the world. An effective programme of social studies is essential in India for the development of good citizenship and emotional integration. The social studies syllabus may be organized in different ways, and both the integrated approach which seeks to combine the knowledge and skills provided by the separate subjects of history, geography, economics and civics, and the traditional method according to which these subjects are treated as separate disciplines, have their own place in a balanced school curriculum.

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[1] *School Mathematics Study Group Series*, Yale University Press, 1960.

8.68. At the lower primary stage, the integrated approach is desirable. Instead of giving the pupils miscellaneous and unrelated bits of information in history, geography and civics, it is far better to provide a coordinated programme of social studies centering round the study of man and his environment. In the upper classes of the primary school, the content of social studies may still be organized as an integral whole in connection with the treatment of certain topics, but the pupils should be gradually introduced to an appreciation of history, geography and civics as separate subjects. In the secondary school, these subjects will be studied as separate disciplines and form the basis of specialized studies in social sciences at the higher secondary stage.

8.69. **Emphasis on National and World Unity.** The syllabus in social studies should lay stress on the idea of national unity and the unity of mankind, throughout the school course, with due regard, of course, to the pupil's age and understanding. Stories of the great heroes of history who have helped mankind on the road to happiness should find a place in the primary history course; but it is the achievements of the great Indians of the past that will figure prominently here. At the secondary stage, however, the history of India should be taught, wherever possible, in the context of world history. Some lessons should be included, at appropriate places, on salient features of world cultures and social development, such as ancient Greece and the Roman Empire, Arab and Chinese civilizations, the Renaissance in Europe, great discoveries and inventions (like the printing machine and its effects on the spread of knowledge), the industrial revolution in England, the French Revolution, the independence movement in America, the awakening of nationalism in the nineteenth century, the development of socialism and the Trade Union movement, the Russian Revolution and the eradication of colonialism in Asia.

8.70. The teaching of geography also should emphasize the unifying rather than the divisive aspects and underline the new concept of 'one world'. Both in history and in geography, the syllabus should bring out not only the political, social, cultural and economic features of the different countries that are studied, but also the process of intercommunication and cooperation between different nations and continents. The course in civics in the senior classes should give a picture of the United Nations and other international agencies and an objective account of their great efforts towards international cooperation and the maintenance of peace.

8.71. **Study of Social Sciences.** At the higher secondary stage, as we have indicated above, there will be specialized studies in the social sciences. There is now an increasing trend to introduce in the curriculum of secondary education, at least in the seniormost classes, some elements of the social sciences and their methods. The new curriculum proposed in the higher secondary classes provides for the special study of history, geography, civics, economics and sociology. But something of the scientific spirit and methods of the social sciences should permeate the teaching of social studies and of history, geography and civics even in the lower classes.

WORK-EXPERIENCE

8.72. We have recommended in Chapter II that work-experience, which involves participation in some form of productive work under conditions approximating to those found in real life situations, should be introduced as an integral part of education at all stages. It will provide a much-needed corrective to the extremely academic and bookish character of present school education. Its educational, social and practical values have already been discussed. We shall now consider the different programmes of work-experience that have to be devised at the school stage to suit the age and maturity of the pupils.

8.73. **Programmes at the Different Stages.** In the lower classes of the primary school, work-experience may begin as simple handwork, the objective being to train children to make use of their hands and thereby help their intellectual and emotional growth. In the senior classes, it may take the form of learning a craft which develops technical thinking and creative capacities in the pupils. Even here, however, some work-experience can be provided in real life situations, such as work on the farms at the time of harvesting or sowing or in a family production unit, and opportunities for this kind of activity should be utilized to the maximum extent possible. As a workshop is proposed to be attached to every school or group of secondary schools in a phased programme spread over the next ten years, work-experience at the lower secondary stage can take the form of workshop training. At the higher secondary stage, where the students will be more mature, and their numbers will be comparatively smaller, work-experience should be made available in school workshops and also on farms and in industrial or commercial establishments.

8.74. The range of possible activities that can be provided in a programme of work-experience is very wide, and the choice will be determined merely by the availability of materials and trained instructors. A list of such activities for the different stages of education is given as an appendix to this chapter.[1] This list is purely suggestive and the activities will be selected with reference to prevailing local conditions. Included in the list are also types of work-experience of special interest to girls or to schools in the rural areas.

8.75. **Work-Experience and Basic Education.** We pointed out earlier that the concept of work-experience is closely related to the philosophy underlying basic education. The programme of basic education did involve work-experience for all children in the primary schools, though the activities proposed were concerned with the indigenous crafts and the village employment patterns. If in practice basic education has become largely frozen around certain crafts, there is no denying the fact that it always stressed the vital principle of relating education to productivity. What is now needed is a reorientation of the basic education programme to the needs of a society that has to be transformed with the help of science and technology. In other words, work-experience must be forward-looking in keeping with the character of the new social order.

8.76. One or two points need special mention. While it is true that productive work-experience in rural areas could be largely built round agriculture, programmes oriented to industry and simple technology should be introduced in a fair proportion of rural schools. In such schools where school workshops cannot be provided, suitable kits of tools and materials may be manufactured at low cost and made available to the pupils. In the same way, steps should be taken to introduce gardening in as many urban schools as possible and to provide experience in farm work to at least a small proportion of urban pupils.

8.77. We realize how difficult it is to make provision for the forward-looking type of work-experience for every child. But a beginning should be made immediately in selected schools and it should be the declared objective of State policy to increase the facilities for work-experience in industry and agriculture as rapidly as possible and to make them available to schools for the education of the rising generation. In the transitional stage, the majority of the children will receive, of course, experience in the traditional programme of production which the community practises. Even here, however a continuous attempt can be made to bring in science and technology and to introduce the pupils to better ways of performing these traditional tasks. It should be realized that the effective value of work-experience is largely proportional to the extent to which the spirit of modernization or a forward-look is built into the programme of work.

8.78. **Implementation.** In implementing the programme of work-experience, three problems have to be tackled (1) training of teachers: (2) provision of necessary facilities including supply of equipment; and (3) progressive extension of the programme to all schools.

(1) *Training of Teachers.* It would be necessary to have specially trained teachers for the higher primary and secondary schools, and special institutions for the purpose may have to be set up The pioneer work done in the Punjab to train teachers in the scheme launched by the Government of Punjab, may show the way to the deve-

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[1] See Supplementary Notes I and II at the end of the chapter.

lopment of similar programmes in other States. While we should work steadily towards this idea of having properly trained teachers for every school, it may be desirable to augment the teacher supply from other sources. Many countries use as teachers for these programmes skilled craftsmen or graduates of vocational schools who are given a short course of training as teachers. The same procedure might be adopted for the middle and lower secondary schools in India. Such teachers might work in one school or be used as itinerant teachers for a group of schools.

(2) *Facilities and Equipment.* In rural areas, farms should be attached to schools wherever possible. Where this is not possible, arrangements should be made to obtain the assistance of the local people to provide work-experience to the students on private farms. In addition, facilities for industry-oriented experience should be provided in all the bigger schools. All secondary schools, whether urban or rural, should be provided with workshops.

The help of industrial concerns might be enlisted to design and manufacture cheap kits for schools and materials which can be used by groups of children and graded for the different school levels. Standardized designs of tools and simple equipment needs might also be given to ITIs, polytechnics, vocational schools and conceivably engineering colleges for manufacture as part of their training programmes.

(3) *Development of the Programme.* A good deal of spade work will have to be done before the scheme is launched and this should be undertaken immediately. It will include the preparation of the necessary literature about the scheme and its introduction to teachers and schools. Short orientation courses will also have to be held for officers of the Department, principals and headmasters. The training of special teachers needed for the programme would have to be undertaken in advance.

It is obvious that the scheme cannot be introduced simultaneously in all schools and that it will be necessary to prepare a phased programme for implementation. It is suggested that, broadly speaking, a beginning may be made in **1967-68** with not less than one per cent of all educational institutions at each stage of education and that this number could be raised to about 20 per cent by the end of the fourth plan and all the institutions should be covered by the end of the fifth plan. Care should also be taken to see that the scheme is left flexible and that it is modified and improved every year in the light of experience gained.

SOCIAL SERVICE

8.79. We have already recommended that some form of social and national service should be made an integral part of education at all stages.[1] It was also pointed out that this could be done by providing for student participation in programmes (1) of community living on the school campus, and (2) of community development and of national reconstruction. Details of both kinds of programmes are given below.

8.80. **Community Living on the School Camps.** There are various opportunities for community work in the classroom, on the school campus and in the school hostels. Here are some of the activities that are being undertaken by the students in many schools today: cleaning the school rooms and the school premises, levelling the playground, preparing and maintaining a school garden, decorating the classrooms and the school, polishing the furniture, whitewashing the walls and painting the doors and windows. Work of this kind should be a common feature in every school. Community living should be particularly emphasized in the hostels, and instead of having a plethora of servants to attend to their needs, the students can do their own room-cleaning, help in the preparation of meals and do other useful hostel work. It need hardly be stressed that all these activities will inculcate in the pupils a sense of dignity of manual labour.

8.81. **Participation in Community Development.** We have already indicated how the organization of programmes of community development and national reconstruction will vary from stage to stage.[2] The primary school can emulate in this respect the example of the basic schools which have done a good deal of pioneering work in the direction of the school serving the community. A well-trained and enthusiastic teacher who maintains good relations with the local community can easily find appropriate situations such as those connected with public sanitation, simple village improvement projects, care of small children and help to the old and the sick, in which the school children can help the community. At the secondary stage, the children are more mature and it is possible to organize programmes of community service at a higher level. We have recommended that each school should draw up and implement its own programme of social service and in liaison with the related departments and agencies set aside about 10 full days in a year (or a total of 30 days at the lower secondary stage and 20 days at the higher secondary stage) for compulsory social service. The students may undertake this service for the prescribed period every year or in a continuous stretch for the total period at each sub-stage of secondary education. The task will demand considerable initiative and enterprise on the part of all concerned, particularly the teachers.

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[1] Chapter I

[2] Chapter I

8.82. It is no easy task to organize an effective programme of social service for all the secondary schools in the country. Its implementation should, therefore, be carried out in stages. To begin with, selected schols of high quality may organize the national service programme on a voluntary basis; and to help them, the Department should draw up model plans of social and community services. The training schools and colleges may take the lead in this regard and help to build up a suitable list of activities for the neighbouring schools. As experience is gained in executing the programme, it may be extended to cover a larger number of schools and students.

8.83. **Labour and Social Service Camps.** While every encouragement should be given to each secondary school to develop its own programme of social service on the lines indicated above, we realize that it will not be possible for many schools to do so, at least for some years to come. We, therefore, recommend that labour and social service camps which will run throughout the year (except during the monsoon season when outdoor work will not be possible), should be organized in each district, and each secondary school which does not have a social service programme of its own should be under an obligation to participate in such camps and provide this rich and valuable experience to its students. For this purpose, a special organization should be set up in each district under the direct control of the district educational officer. It will be the responsibility of this organization (1) to select one or more specific projects on which students can work all the year round; (2) to provide the necessary community contacts; (3) to assist in providing residential arrangements, implements, utensils, etc.; and (4) where possible, to provide a part of the expenditure of the entire organization of the camps. The schools will be responsible for drawing up the programme for their participation, in consultation with this district agency, for taking the students to the camp, and for guiding the students in carrying out the projects assigned to them.

8.84. Great care should be taken in selecting the projects for the camp. The idea should be to take up a project which could be completed within the time given. This would make the students and teachers feel that they are doing something worthwhile, something which results in a lasting benefit to the community. The co-operation of the Community Development Administration should be sought for the purpose and the project should be connected with the five year plans for the area.

8.85. During the period of the camp, students would be expected to put in 8 hours of work per day and the general routine would be as follows:

2 hours — personal time in morning.
2 hours — intellectual work not connected with school studies.
6 hours — manual work.
2 hours — intellectual work not connected with school studies.
2 hours — rest and recreation.
2 hours — personal time in the evening.
8 hours — sleep.

8.86. A part of the funds for the programme could be obtained from the local Rural Works Programme. All the overhead charges—which will come to a very small amount—should be met by Government. The students should be required only to bear (1) transport charges to the camp site and back, and (2) food charges during the stay at the camp. Even these could be subsidized to some extent on the basis of the work that the students put in. A student who holds freeship or half freeship should be given similar concessions in the camp Adjustments could also be made by requesting the students to bring some articles of foodstuffs etc. from home. On the whole, an attempt should be made to keep the cost of this camp down to the minimum for each period. Moreover, camps for boys and girls will have to be organized separately but there need not be much difference between the types of programmes undertaken for them.

8.87. The preliminary spade-work to be done for this scheme would be similar to that of work-experience described earlier. We suggest that the programme may be started, as a pilot project, in about five per cent of the districts to begin with and that it should be extended to the country as a whole in a period of about ten years. It may also be incidentally stated that when this programme becomes general at the secondary stage, there would be no difficulty in extending it, on the same lines, to the university stage also.

PHYSICAL EDUCATION

8.88. There has been a tendency in recent government schemes of physical education to emphasize only the physical fitness value of physical education and ignore its educational values. It must be emphasized that such education contributes not only to physical fitness but also to physical efficiency, mental alertness and the development of certain qualities like perseverance, team spirit, leadership, obedience to rules, moderation in victory and balance in defeat. A satisfactory programme of physical education can be developed only on the basis of the following principles:

(1) The physical education programme should be planned for desirable outcomes keeping in mind the interests and capacity of the participants.

(2) The traditional forms of play and physical activities that have developed in our country should receive due emphasis in the programme.

(3) The activities promoted should develop in each child a sense of personal worth and pride.

(4) A sense of sharing responsibility in a spirit of democratic cooperation should grow from experience on playground and also in the gymnasium.

(5) The programme offered should supplement other programmes of education and not duplicate them.

(6) The programme should be within our financial means.

(7) The programme should reach all rather than a selected few.

(8) Special instruction and coaching should be provided for students with talent and special aptitude.

8.89. Physical education should include developmental exercises, rhythmic activities, sports and games, outing activities and group handling activities. All these have simple and advanced forms. The simpler activities should be introduced in the early classes, the more advanced ones should be gradually provided as boys and girls become more and more mature.

8.90. The very young are not psychologically and physically mature for formal and vigorous forms of activities. Their sense of basic movements and coordination have to be developed gradually. The syllabus for the young at the pre-primary and the early primary stages should be based on their desire to imitate movements around them, their spirit of play, their wanting to dare and to do something better than their comrades. This is the most vital stage of 'education through movement'. A child should develop mastery over basic skills, such as walking properly, running, dodging, throwing, etc. Higher forms of coordination like accuracy and precision must wait for the next stage.

8.91. As the child grows into the pre-adolescent stage, his interests and capacity change and physical education should provide for more challenging activities, opportunities for simple team play and finer forms of skills. The adolescent in the secondary school desires to imitate the activities of the adults, and he should be given sports, games and athletics in their standard form. Skills learnt earlier should be perfected through guidance and practice. It is an age when boys and girls desire excellence and the physical education syllabus must include techniques for good performance.

8.92. At the primary stage, except in the last two classes, a common syllabus for boys and girls can be used. From there onwards, the syllabus should be planned separately keeping in mind their respective interests and abilities. Rhythmic activities will have an appeal for girls, non-contact and less strenuous games such as badminton, throw-ball, etc., are popular. The more vigorous games, such as basket-ball, net-ball and hockey may be brought in at a later stage. Athletic items in standard forms should also find a place.

8.93. The preparation of programmes of physical education for all stages should take into account not only what is useful but also what is possible in view of the limitations of facilities, time and number of teachers. In recent years a number of schemes like the National Plan of Physical Education prepared by a group of experts at the request of the Ministry of Education, the National Discipline Scheme and the Auxiliary Cadet Corps with several common activities began to vie with one another. A special committee appointed by the Ministry of Education under the chairmanship of Dr. H. N. Kunzru recommended that an integrated scheme with a syllabus selecting the best features of each should be evolved. The committee tried to bring about a compromise between the claims made by the enthusiasts of different schemes, and the result is a mixed programme of physical education called the National Fitness Corps. There is a danger that in the implementation of the new scheme, the educational purposes of the programme might be forgotten or neglected. As the compromise scheme has provoked a good deal of criticism, we suggest that the matter be examined once again and a programme of physical education be designed in the light of the principles enunciated above.

EDUCATION ON SOCIAL, MORAL AND SPIRITUAL VALUES

8.94. A serious defect in the school curriculum is the absence of provision for education in social, moral and spiritual values. In the life of the majority of Indians, religion is a great motivating force and is intimately bound up with the formation of character and the inculcation of ethical values. A national system of education that is related to the life, needs and aspirations of the people cannot afford to ignore this purposeful force. We recommend therefore that conscious and organized attempts be made for imparting education in social, moral and spiritual values with the help, wherever possible, of the ethical teachings of great religions.

8.95. **Education through Indirect Methods.** This education, we believe, should be provided, both by direct and indirect methods, by suggestion as well as by discussion and teaching. We attach great importance to the role of indirect influence in building up good character. The school atmosphere, the personality and behaviour of the teachers, the facilities provided in the school will have a large say in developing a sense of values. We would like to emphasize that the consciousness of values must permeate the whole curriculum and the programme of activities in the school. It is not only the teachers in charge of moral instruction who are responsible for building character. Every teacher, whatever be the subject he teaches, must necessarily accept this responsibility. He must ensure that, in the teaching of his particular subject and in his dealings with his pupils, fundamental values such as integrity and social responsibility are brought out. The teacher need not, we can even say that he should not, try to draw out the underlying moral all the time; but if he has given some thought to the values underlying the scope of his subject and his work as a teacher, they will imperceptibly pass into his teaching and make an impact on the minds of his students. Moreover, a sense of purpose should inspire all school activities and must be reflected in the life, tone and atmosphere of the school. The school assembly, the curricular and co-curricular activities, the celebration of religious festivals of all religions, work-experience, team games and sports, subject clubs, social service programmes—all these can help in inculcating the values of co-operation and mutual regard, honesty and integrity, discipline and social responsibility. These values have a special significance in Indian society today, when young men and women are passing through a crisis of character.

8.96. **Direct Instruction of Moral Values.** In addition to this indirect approach for inculcating moral and spiritual values, we consider that specific provision for direct moral instruction in the school programmes is highly desirable. We agree with the recommendation of the Sri Prakasa Committee[1] that one or two periods a week should be set aside in the school time-table for instruction in moral and spiritual values. At the primary stage such instruction will generally be imparted through interesting stories, including stories drawn from the great religions of the world. At the secondary stage, there may be frequent discussions between the teacher and the pupils on the values sought to be inculcated. Whatever be the method of teaching, it should not lead to moral instruction being divorced from the rest of the curriculum or being confined to a single period. If the values are to become a part of the student's character, an all-embracing treatment of the moral way of life is needed.

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[1] *Report of the Committee on Religious and Moral Instruction*, Ministry of Education, Government of India, New Delhi, 1960.

8.97. **Relation Between Moral Values and Religion.** There will be natural points of correlation between the moral values sought to be inculcated and the teachings of the great religions. Stories drawn from the great religions of the world will be most appropriate in a discussion of moral values and of problems in life. All religions stress certain fundamental qualities of character, such as honesty and truthfulness, consideration for others, reverence for old age, kindness to animals, and compassion for the needy and the suffering. In the literature of every religion, the story or parable figures prominently as a means of impressing an ethical value on the followers. The narration of such stories by the teachers at the right moment in the programme of moral education would be most effective, particularly in the lower classes.

8.98. At a later stage, accounts of the lives of great religious and spiritual leaders will find a natural place. Some of these may be included in the study of social studies or literature, but it is essential that all important religions are represented properly in the programme. Similarly, the celebration of the festivals of different religions will afford opportunities for the narration of incidents from the life history of the leaders of these religions. In the last two years of the secondary school, a place should be found for the study of the essential teachings of the great religions.

Creative Activities

8.99. We have given some attention in the preceding discussion to the subject areas of languages, science and mathematics, social studies, work-experience, social service, physical education and moral and spiritual values, since we feel they require a new orientation in the school curriculum. There are two other subject areas—arts and co-curricular activities—which we shall now consider very briefly to round off the discussion.

8.100. **Art Education.** In an age which values discovery and invention, education for creative expression acquires added significance. Unfortunately, the fine arts are too often regarded as frills added to 'real' education and are neglected because they are not examination subjects. Adequate facilities for the training of teachers in music and the visual arts do not exist. The neglect of the arts in education impoverishes the educational process and leads to a decline of aesthetic testes and values. We recommend that the Government of India should appoint a committee of experts to survey the present situation of art education and explore all possibilities for its extension and systematic development. In this connection we commend the establishment of Bal Bhavans in all parts of the country with substantial support from the local community. Art departments at the university level should be strengthened at a few selected centres and research in these fields should be encouraged.

8.101. **Co-curricular Activities.** With regard to co-curricular activities, some of them have already been referred to in our discussion of programmes of work-experience, social service and physical education. We conceive of the school curriculum as the totality of learning experience that the school provides for the pupils through all the manifold activities in the school or outside, that are carried on under its supervision. From this point of view, the distinction between curricular and extra-curricular work ceases to exist, and a school camp and games and sports are curricular or rather co-curricular activities. There are, however, certain activities of this type such as hobbies of different kinds, debates, dramas which have more of the quality of play than of work and which give greater opportunities for creative self-expression. Every shool should organize a variety of such programmes so that every child in it may be able to take up something suited to his tastes and interests.

Differentiation of Curricula for Boys and Girls

8.102. Before closing the discussion, we shall briefly refer to two important issues related to the school curriculum: (1) differentiation of curricula for boy and girls, and (2) basic education.

8.103. The first of these issues was specially examined by a committee appointed by the National Council for Women's Education under the chairmanship of Smt. Hansa Mehta. This Committee made the following recommendations on the subject:

(1) In the democratic and socialistic pattern of society which we visualize, education will be related to individual capacities, aptitudes and interests which are not strictly related to sex. There would, therefore, be no need in such a society to differentiate curricula on the basis of sex.

(2) In the transitional phase in which we are at present, certain psychological differences between men and women as well as certain divisions of social functions based on them will have to be accepted as a matter of fact and as a practical basis for building up the curricula for boys and girls. While doing so, however, care should be taken to see that values and attitudes which are essential in the long run are increasingly built up in men and women and that no step is taken which will tend to perpetuate or intensify the existing differences.

We agree with these recommendations. It will be noticed that we have proposed a common curriculum for all the students till the end of Class X and options have been allowed only under work-experience or language. It is also possible to study the subjects included in the curriculum at two levels—higher and lower. These options are open equally to boys and girls.

8.104. The following points deserve notice:

(1) Home science is one of the options provided in the curriculum proposed by us at the higher secondary stage. This would be a popular subject, but it should not be made compulsory for girls.

(2) Music and fine arts form another group of subjects which are popular with girls. At present, the provision made for the teaching of these subjects at the secondary stage is meagre. Steps should be taken to introduce these courses on a larger scale.

(3) Mathematics and science are important subjects and adequate preparation therein is essential to gain admission to significant courses at the university stage. Special efforts should, therefore, be made to encourage girls to study mathematics or science at the secondary stage and special efforts should be made to prepare women teachers of mathematics and science.

The New Curriculum and Basic Education

8.105. The movement of basic education launched by Mahatma Gandhi more than 25 years ago, proposing a new type of elementary education for the nation which would centre round some form of manual and productive work and have intimate links with the life of the community, was a landmark in the history of education in India. It was a revolt against the sterile, book-centered, examination-oriented system of education that had developed along traditional lines during several decades of British rule. It created a national ferment, which may not have transformed the quality of education at the primary stage, but which has certainly left its impact on educational thought and practice in a much wider sphere. We believe that the essential elements of the system are fundamentally sound, and that with necessary modifications these can form a part of education, not only at the primary stage, but at all stages in our national system. These elements are : (1) productive activity in education; (2) correlation of the curriculum with the productive activity and the physical and social environment; and (3) intimate contact between the school and the local community. We indicate below how each of these has become an important element in the educational system we have proposed.

8.106 With regard to productive work, we have already explained that the concept of work-experience as proposed by us is similar to that of productive work in basic education. At the primary stage, the resemblance between the two programmes is very close. We have, however, extended the concept to secondary education also; and in our opinion, even institutions of higher education and universities have a special role to play in the development of work-experience as an integral part of education. It is they who set the fashion for the entire educational world and success for the programme would be ensured by launching it effectively and on a large scale at this stage. From this point of view, we feel that it would be worthwhile to organize some special programmes for work-experience in universities and other institutions of higher education. For instance :

(1) In the case of some selected institutions in science and technology, it would be most stimulating and profitable from every point of view, to assign to them some carefully chosen industrial/scientific projects.

The institutions should carry the projects through all stages, up to full-scale production.

(2) Some institutions should take up the manufacture of workshop and scientific equipment required for schools and colleges.

(3) Some institutions could take up the manufacture of furniture, teaching aid etc., needed by themselves or those in the neighbourhood.

8.107. In our proposals, correlation which is the second important aspect of basic education is also extended, to the extent possible throughout the educational system. At the primary stage, the view in basic education has been that the curriculum content should be integrated, as far as practicable, with craft work and with the physical and social environment of the child. Our proposals at the primary stage are very similar to this. At the secondary stage, we have suggested that work-experience should be integrated with the curriculum content and that the teaching of subjects should be correlated, as far as possible, with the environment. In higher education, we have emphasized the provision of greater elasticity in the choice of subjects, inter-disciplinary studies and the need to relate teaching and research to the understanding and solution of the local, regional, and national problems.

8.108. With regard to the third essential element of basic education, namely, school-community relationship, it has been discussed elsewhere in this report[1]. Basic education places considerable emphasis on the organization of the school as a living and functioning community, with a lively programme of social, cultural and recreational activities. It need hardly be stated that every good school should organize its corporate life in this way. What is of even greater importance in making children social minded and cooperative is the active participation of the school in the life of the local community. Many existing basic schools have set an excellent example in respect of service rendered to the people in the neighbourhood; and this programme of participation in community life and social service, as we pointed out, should now become an integral part of education at all stages. Our secondary schools and colleges as well as our primary schools should establish close contact with the community outside and take part in projects of social work and national reconstruction so that the students may acquire the spirit of discipline, learn the dignity of manual labour and develop a keen sense of their obligations and responsibilities to the community and to the nation at large.

8.109. The above discussion will make it clear that, in our view, the essential principles of basic education are so important that they should guide and shape the educational system at all levels. This is the essence of our proposals; and in view of this, we are not in favour of designating any one stage of education as basic education.

8.110. **Conclusion.** We have discussed in this chapter the curricular content at the different stages of school education. The main shift in emphasis in these proposals is towards a more unified approach in framing the entire school curriculum, a new definition of the content of general education, and a new approach to the place of specialization. Our overall concept is that general education requires strengthening in the areas of science, work-experience and moral and spiritual values, and a new orientation in some other areas. It should cover ten years of undifferentiated schooling before some specialization begins. It should not be too sharply divided from vocational education. To be successful, these reforms require an orientation in teaching methods, evaluation and guidance. We shall turn our attention to these issues in the following chapter.

SUPPLEMENTARY NOTE I

GENERAL PROGRAMMES OF WORK EXPERIENCE

The range of possible activities which can be adopted to provide productive work-experience is enormous and choice will be determined mainly on the availability of materials and trained instructors. The list given below is purely indicative and the choice of activities would be made in the light of prevailing local conditions. Included in the list are also activities of special interest to girls or to schools in rural areas:

Lower Primary School

- Paper cutting
- Cardboard cutting and folding
- Modelling in clay or plasticine
- Spinning (where natural in the environment)
- Simple needlework
- Simple planting indoors or on plots
- Kitchen-gardening

Higher Primary School

- Cane and bamboo work
- Leatherwork
- Pottery
- Needlework
- Weaving
- Gardening
- Model making
- Fretwork
- Work on the farm

Lower Secondary School

- Woodwork
- Simple metalwork
- Basketwork
- Leatherwork
- Ceramics
- Soapmaking
- Tanning
- Preserving
- Weaving
- Electrical repairs
- Cookery
- Model making
- Making simple scientific equipment
- Classroom decoration
- Carpet making
- Bookbinding
- Linocutting
- Fabric printing
- Tailoring
- Toy making
- Millinery
- Wood carving
- Simple farm mechanics
- Animal care
- Crop care
- Care of the soil
- Workshop practice

Higher Secondary School

Many of the activities listed above would be continued but the emphasis would shift to workshop practice or actual work-experience in industrial or commercial concerns or on farms. The activities would be oriented towards productive work. Skills demanded in woodwork, metalwork and agriculture would be of a higher and more exacting nature.

SUPPLEMENTARY NOTE II

GENERAL PROGRAMMES OF WORK EXPERIENCE IN USSR

(EXTRACTED FROM POLYTECHNICAL EDUCATION IN THE USSR, EDITED BY S. G. SHAPOVALENKO AND PUBLISHED BY UNESCO, 1963.)

In *grade I*, they work with paper, pasteboard, cloth, clay and plasticine, and do simple work on plant-growing. In working with paper, they acquire such basic skills as learning to mark out, bend and fold paper and pasteboard, cut them with scissors or knives along marked lines, and glue and paste them. This work is well within the scope of a seven-year-old and in carrying it out, the child learns to work accurately with pencil, ruler, scissors and glue, to make simple articles for his own use (*e.g.*, material for doing sums, bookmarkers, packets for seeds, notebooks for word-lists, Christmas cards, etc.). In working with cloth, the children learn to sew on buttons, to sew simple little objects (pen-wipers, handkerchiefs, etc.) and to look after their own clothes. The work with clay and plasticine has considerable educational value, for it develops their power of observation, creativeness and taste. In their modelling work, they develop co-ordination of movement, dexterity, the ability to measure by eye and the idea of space.

On the school experimental plot they learn to grow flowering plants in special beds, and both in class and at home they acquire the first practical skills in tending indoor plants.

In *grade II*, the children also work with paper, pasteboard, clay and plasticine and continue to learn sewing and work on the school plot, but the tasks are more complicated. The children cut out shapes from paper and pasteboard along marked lines, glue them together, and learn to use the graduated ruler and set-square for simple measurements and for checking the quality of their work, on the basis of the progressive development of their desire for accuracy.

In their work with clay and plasticine, they develop, as in grade I, the ability to recognize and reproduce accurately the shape of relatively simple and familiar objects, for example, they model from life (or from memory) fruits and vegetables. In their work with cloth, they do very simple and ordinary stitches and learn how to embroider very simple designs on serviettes and sew little bags and other uncomplicated objects. They also learn how to use the tape measure and ruler for simple measurement, mark out rectangular shapes for making patterns, and become accustomed to looking after their own clothes, doing simple mending, etc.

On the school plot they grow pulses, and in class and at home they continue to look after indoor plants and grow flowers in jars, flower-pots and boxes. Working on the school plot, they dig beds, make them smooth, use a markercord to align the drill-furrows in which they sow the seed and observe the growth of plants.

The task of developing proficiency in work with paper and pasteboard continues in *grade III*. The pupils make and mend simple visual aids needed for teaching Russian, arithmetic and natural history, and learn to mark out paper more accurately, to rule lines, to glue paper to pasteboard and to frame flat cardboard articles of simple shape with paper strips. They acquire skills in elementary bookbinding, making simple pads, notebooks and small file-cases, and binding pamphlets, etc. They perfect their knowledge of fabrics in grade III, continue to learn sewing and embroidery and begin to darn stockings and socks. They learn to cut out and sew very simple articles (aprons, mittens, small bags, etc.) and acquire an elementary idea of dressmaking and tailoring and learn simple methods of mending clothes.

On the school plot they cultivate beetroots, carrot and their seed, and plant and tend strawberries. They dress the beds themselves, sow dry, wet and germinated seed, thin out root crops, transplant beet and cabbage seedlings, look after seed-plants, apply top-dressing and conduct simple experiments with the plants. As far as indoor plants are concerned, the children learn how to plant flower seedlings in pots, jars and boxes.

In *grade IV*, work is continued, and the proficiency acquired in manipulating paper and pasteboard is consolidated. The children make file-cases and pads, repair maps, diagrams and other visual aids made of paper or pasteboard, stick diagrams, photographs and reproduction on pasteboard backings and make models of simple geometrical forms.

They go on with their sewing, embroidery and knitting, and undertake more complicated dressmaking work: they take measurements of their own, note them down, make the rough sketch, cut out the patterns, cut out the cloth on their own and for the first time sew simply constructed articles. They also learn about looking after clothes and simple mending, and they crochet belts and small scarves. They also learn how to use sewing machines and flat irons, and are taught to observe the basic safety rules in using them.

The object in grade IV of technical modelling work is to develop the children's technical-mindedness and power of creative design. The syllabus accordingly provides for the preparation by the children of simple equipment for natural history experiments and simple methods and mock-ups of various machines.

On the school plot, they grow potatoes and maize, learn how to plant currant cuttings and to tend and look after the plants. In class and at home, they learn how to propagate indoor plants from cuttings, and this work provides a good preparation for the systematic study of botany in grade V.

The knowledge, accomplishments and skills which they acquire in the work lessons in the junior grades (I-IV) are of major importance from the standpoint of polytechnical education, providing a thorough grounding for further manual and technical and polytechnical instruction in grades V-VIII. In addition, the knowledge, accomplishments and skills acquired by the younger children make it possible to initiate them progressively into socially useful work and housekeeping work at school and in the home.

Instructions in Grades V-VIII. The object of manual and technical instruction in these grades is to impart general technical, agricultural and domestic knowledge and skills to develop technical thinking and creative capacities in the pupils; to foster in them a communist attitude to work and to labour conditions in general; to help them give expression to their own inclinations, find their bearings in the various spheres of human activity, and make a careful choice of their future vocation.

The instruction given in these grades at the eight-year school is polytechnical in character. It includes work in the school workshops, practical and experimental work in agriculture, and domestic-science activities, three periods a week being devoted to these in every grade (V-VIII).

In the school workshops, the pupils become knowledgeable and proficient in woodwork and metalwork with the use of hand tools and certain machine tools. Most of the metalworking operations in factories and plants are carried out, of course with the help of a variety of machines, but manual work is also used to some extent in every branch of production for the successful operation of a machine, the elimination of breakdowns, and the assembly and adjustment of mechanisms. Hence the study and mastery of the method of working these most commonly-used materials—metals and wood—with hand tools are of great importance for the pupils' polytechnical education and technical training, and the procedure employed is to get them to make various useful articles, including equipment, models, mock-ups, tools and implements for use in the school workshops and on the school plots, articles for use in pioneer activities or for the pupils' personal use, toys, etc., and component parts manufactured to the order of factories and of collective or State farms. These activities are chosen and carried out in a particular sequence, progressing from the simple to the more complex, so that their execution helps to consolidate and develop the skills which the pupils have already acquired in working with the materials.

The eight-year-school pupils also acquire some knowledge of the mechanisation of labour processes. They learn about the construction of the commonest simple machines and mechanisms and how to use them. The wide application of electric power in modern industry, agriculture, transport and everyday life makes it essential that every pupil who leaves the eight-year school should have acquired some elementary knowledge and skill in handling the commonest electrical equipment and electric appliances.

In the workshops, they learn to read and prepare very simple technical drawings, sketches and blueprints, and to transfer the data to the material. The basic method of instruction consists in interpretng the drawings of articles which have to be prepared in practice. The work with drawings at all stages of school workshop activity is organized in such a way as to make use of the knowledge and skill which the pupils have acquired in their studies of drawing, mathematics and (from grade VII onwards) technical drawing.

Various methods are used for instruction in the workshop; oral instruction (talk, explanations, discussions); demonstration of natural objects, visual aids and working methods; exercises; individual and group instructions; independent work from drawings or instructional charts; graphic work; special laboratory work for the practical education of the properties and peculiarities of materials, the construction of tools, components and appliances, the interaction of tools and materials, and other technical and technological questions; excursions to industrial undertakings to familiarize the pupils with the organization of work at plants and factories, the mechanization of production and the construction of individual machine tools and appliances with the help of which the pupils carry out the operations which they have studied and mastered in the school workshops.

In grades VII and VIII, the pupils are given set tasks on their own, commensurate with their capacity, in making components and complete articles.

The technical and technological knowledge imparted to the pupils broadens their general technical outlook and is an essential factor in correctly developing their skill in the use of materials. In its turn, the acquisition of practical skills enables them to acquire a deeper appreciation of technology and an understanding of the working principles of machine operation in processing materials, and of mechanized production in general.

The teacher's explanations, with their marked technical bias, are based on the knowledge acquired by pupils in their studies of the fundamentals of the various sciences. On the strength of what they have learnt in physics, for example, they can be given the scientific reasons for a number of technical phenomena and technological processes; again, in studying the mechanical properties of materials and machine parts, andthe construction and operation and mechanisms of machines and machine tools, they make use of their knowledge of mechanics.

A prominent feature of this instruction is the comparison made between the processes and tools used in woodwork and metalwork, and the elucidation of their similarities and differences, depending on the characteristics of the materials processed. The pupils steadily enlarge their knowledge of the correct use of tools, correct working stance, proper rhythm of work and the essential technical and health measures to ensure high productivity and the necessary standards of workmanship with the minimum loss of energy.

Apart from wood and metals, the pupils in grades VII and VIII get to know materials such as plastics and glass, which are very useful for making items of school equipment or items ordered by factories and farms.

In order to broaden the pupils polytechnical outlook, comparisons are also made between their work in the workshop and similar technological processes carried out under production conditions, and also between manual and machine processing, and the syllabus accordingly provides for excursions, demonstrations of diagrams, mechanisms and machines, and the showing of films and filmstrips. With the same object in view, some of the jobs are executed on the basis of a division of labour as regards particular items and operations, and this form of organization of labour gives the pupils an insight into how work is organized at an industrial plant.

The school workshops provide favourable conditions for conducting out-of-class technical work on a large scale; many school clubs have been organized in grades V—VIII so that they can engage in technical modelling, electrical engineering and radio engineering, or delve deeper into and become proficient in carpentry, light engineering, lathe work with wood and metal, woodcarving, fret-work, etc.

Workshop activities in these grades are different for boys and girls. Whereas the boys take both woodwork and metalwork, the girls take only woodwork in grade V and only metalwork in grades VI—VII. They do less mechanical engineering than the boys in grade VIII, but the syllabus in electrical engineering is identical for boys and girls alike.

To take account of the special characteristics of technical instruction for girls, the eight-year school gives them a training in domestic science which provides them with knowledge and skills in housekeeping work.

In the course of their domestic-science work they are familiarized with the social arrangetions to share in the general domestic duties of the family and to be self-reliant at school and at home; to acquaint them with the principles of domestic economy, give them the necessary knowledge and skill to carry out various forms of everyday domestic work, and inculcate good taste and a constant desire and ability to keep a place tidy, clean and comfortable.

In the course of their domestic-science work they are familiarized with the social arrangements for everyday domestic work and the communal forms of public service such as communal catering, the work of domestic service centres, the organization of communal sewing-room for making and mending clothing; underwear and footwear; and to get to realize how the everyday household work of the Soviet family is being systematically and steadily lightened. A special point is made of familiarizing them with the use of modern labour-saving devices and with new materials, fabrics, foodstuffs and so on. The result is that they learn to be tidy, thrifty and punctual, and develop a love of cleanliness and order and the ability to make their homes and clothes attractive and sensible and use foodstuffs and materials economically.

The study of domestic science in the senior grades is based on the knowledge and skill acquired in the work lessons in the junior grades, and also on lessons in Russian (or the mother-tongue) on the subject of 'The care of health' (in grades I--III) and on the natural-history lessons on the subject of 'The human body and its care' (in grade IV).

In studying the subject 'Cutting and Sewing', the girls become acquainted with fabrics, with the preparation of designs and patterns for articles they are making, with methods of sewing and mending, and with the construction and operation of the sewing-machine. They also acquire a basic knowledge of the care of clothing, of laundering, ironing and storing linen, of cleaning woollen garments, and of laundering knitwear containing synthetic fibres.

One important section of the syllabus is the elements of cookery, including instruction in dietetics, and in the foodstuffs required by the human body. The girls learn how to prepare simple vegetable dishes and cook simple and nourishing meat and fish dishes, handle kitchen equipment, crockery, and table linen, and serve and behave at table.

Under the heading of 'Housework' they acquire a basic practical knowledge of home hygiene and sanitation and the essentials of housekeeping (daily, periodical and spring cleaning; ventilation, lighting and heating). In addition, they learn how to arrange furniture and handle tablecloths, curtains, carpets, pictures, photographs, reproductions and decorative tapestries.

To widen their horizon and enlarge their knowledge in various fields, excursions are arranged to public restaurants or food-processing factories (canteens, mechanized restaurants, canneries, butter factories, bakeries), garment-making establishments (tailoring and dressmaking workshops), or to domestic-service centres. These excursions are arranged during the school years in accordance with a timetable drawn up by the teacher.

All the pupils at urban and rural eight-year schools receive initial training in both agricultural and industrial labour, for familiarization with agricultural production is one of the tasks of polytechnical training. This work is closely co-ordinated with the biology course, and is of great educational significance. It is carried out both on the school experimental plot and under actual production conditions, and as it takes place for the most part in the open, it promotes the children's physical development and improves their health.

To meet local conditions, the school is empowered to spread the practical and experimental work evenly over the school year, or to concentrate it in the first and fourth quarters. And since it is of a seasonal nature and is to some extent governed by the weather, it is not included in the timetable but is carried out in accordance with a time-schedule approved by the school director.

In the course of this work, the pupils acquire basic practical skills in cultivating the main agricultural crops (vegetables, fruit and berries, field crops and in rural areas—in raising calves. At the same time, they acquire a knowledge, during their excursions, of mechanized cultivation and animal husbandry.

The work in grades V and VI is largely conducted on the school plot. In grades

VII and VIII (at rural schools) the pupils work on collective and State farms and fields where they operate in groups on jobs suited to their capacity. Looking after poultry, rabbits and young farm animals, or doing suitable field work, depending on local conditions (the tilling of the soil, and often sowing and harvesting, are done by pupils in grades X-XI or by collective farmers with the aid of agricultural machinery).

In urban schools which have no school plots, the practical and experimental work in grades V-VII is carried out in greenhouses on grounds belonging to pioneer homes, of Young Naturalists' Centres, in conservatories, parks and squares coming under the Greenery Trust and at specialized suburban agricultural undertakings. In addition, plots of pioneer camps are made available to the children for educational and production work during the summer.

Their excursions to agricultural production points give the children an insight into the mechanized side of agriculture on collective and State farms. In grade V, for example, they study the mechanization of market-gardening, in grade VI they learn about mechanical work in horticulture, and in grade VII (in urban schools) they become familiar with the mechanization and cultivation of field crops and with heavy work' in stock-raising. The grade VIII syllabus (at rural schools) provides for a more detailed study of soil-working implements, seed-drills and grain-cleaners and harvesters. The pupils get to know the local collective or State farm and the lines on which it is developing and this generally acts as a factor in the vocational guidance of the school-leavers.

The content of the syllabus for practical and experimental work during the eight-year period of schooling ensures that the pupils conscientiously apply the knowledge acquired in their biology lessons.

Due account is taken, in following the syllabus, of local soil and climatic conditions and the main crops in the area concerned. Some of the jobs, for example, can be replaced by other equivalent ones (for instance, the syllabus recommends the autumn sowing of fruit trees, but on heavy clay soil the seeds are stratified and the sowing is done in spring; or in southern areas, seedings are cultivated in seed-beds instead of under glass).

The experimental bias is particularly important. Experiments on the school plot which have given the most productive and economic results are repeated on the plot the following year and then tried out on the collective or State farms, where the pupils carry out so-called 'productive' experiments. Where the results prove positive, they are incorporated into agricultural production.

Many eight-year general schools have started an original type of fruit and berry plantation stocked with the finest strains. The cultivation of seedlings of fruit trees and ornamental plants (in urban schools), the taking of cuttings of the finest strains of currants and other soft fruits, and the grafting and cultivation of the best strains of fruit trees are in fact an important element in practical school work.

The cultivation of seedlings and the work in the nursery garden plays a very important part in agricultural education in grades V-VII (and also in grade VIII at rural schools). In the latter, the pupils study the cultivation of apple trees, while in urban schools they study the propagation of valuable types of trees and of perennial flowering plants such as phlox, lilac, roses, etc. A substantial area (300 to 500 square metres) is provided at rural schools for nursery seed-beds, while urban schools can arrange for nurseries to be established in the gardens of dwellings in the neighbourhood.

An equally important item in grade V practical work is the cultivation of vegetable seedlings in green-houses, under glass and on hotbeds. Where a greenhouse is available on the school plot, practical work can be carried out in early spring. Apart from growing vegetables, the children grow fruit trees from seedlings, propagate currant bushes, and learn by practical experience the best times and methods for thinning out seedling trees, the best method of taking cuttings of currant bushes, the best way of applying organic and mineral fertilizers to the various vegetable crops and seedling stock and the amounts needed, the best times to sow and plant vegetables and the correct amounts of mineral fertilizer to be used as a top dressing for vegetables. At the urban schools, experiments are conducted to find out the best methods of vegetative propagation of perennial flowering and ornamental plants, the best system of feeding and tending them, the best system of rooting cuttings, etc.

In grade VI, the pupils experiment on the accelerated propagation of valuable strains of raspberries (or trees, in schools in large towns); they learn about the best methods of grafting scions and discover the best means of preparing maize and potatoes for planting, the richest areas for arable crops. the effect of various methods of treatment in increasing the yield of maize, potatoes and seed-plants of biennial vegetables. These experiments, the object of which is to apply and develop the chlidren's knowledge of biology, are carried out on subdivisions of the experimental plot.

In grade VII at rural schools the experimental work is carried out under agricultural production conditions. The pupils grow maize, potatoes and industrial crops on plots provided for the school and divided up in accordance with the number of pupils in grades VII and VIII. They also tend farm animals on collective and State farms.

The points on which the work is focussed, and the subjects of the experiments are chosen to suit local conditions and lines of future agricultural development.

As stated, the children at urban schools plant greenery in the towns and on workers' estates, look after trees and bushes in the public squares, streets, etc., and help collective farms to look after tree belts and plantations along the main roads. The cultivation of ornamental shrubs and flowering plants, the planting of greenery in courtyards and squares, and work in parks and conservatories, is treated as a matter of major importance.

Included in practical work is the campaign against agricultural pests, which takes various forms—mechanical, chemical and biological. Special attention is paid, in the children's experimental and practical work during school hours, in their educational production practice during the summer and in their socially useful work, to the observance of health requirements and the inculcation of habits of hygiene in connection with work.

All these arrangements for systematically raising the level of the children's agro-technical and zoo-technical knowledge, and familiarizing them with the principles underlying agricultural production are of great importance in training efficient workers who have an all-round education.

Social Production Practice. The work done by the pupils in the course of instruction is very definitely slanted in the direction of social usefulness, and two periods a week are devoted to socially useful work in every grade (V-VIII) with the object of coping with the subject of manual and technical instruction more effectively and forging links between education and life. In addition, twelve days are set aside at the end of the school year for social production practice—three periods a day in grade V and four periods a day in grades VI-VIII. This socially useeful work takes place outside school hours, and is therefore not included in the timetable. The general educational direction of this work is in the hands of the class teacher, who prepares a plan of work for each successive week, but the immediate handling of it may be entrusted to other teachers, depending on its nature.

Social production practice in urban and rural schools forms a continuation of the manual and technical instruction given in the school workshops and on the school plots, and is based on the knowledge and practical skills acquired by the pupils in the various grades. It includes doing work suited to the pupils' age in the school's training and production workshops, making various articles for use in the school itself and the kindergarten and fulfilling orders from industry. In agriculture, it constitutes a continuation and extension of the experimental and practical work prescribed by the syllabus, thus making it possible to arrange for the systematic tending and observation of plants sown in spring at the proper sowing times and bring in the harvest and evaluate the yield by the due date.

This work ensures the continuation and completion of experiments with vegetable crops and fruit-tree seedlings, conducted in grade V, and with fruit crops, maize, potatoes and the seed-plants of biennial vegetables on the school plots in grade VI, the pupils carrying out practical work and making the corresponding observations, at the proper time in accordance with a schedule prepared by the school director.

In grade VII at rural schools, the work involves tending maize and other field crops on collective or State farms and conducting experiments relating to them, raising poultry and rabbits, and looking after fruit seedlings on the school plot. The pupils carry out these jobs in accordance with the director's schedule, working in groups (in view of the need to complete the experiments begun during school hours). At urban schools, the grade VII work is limited to tending field crops on the collective or State farm, or, where it is impossible to organize this in agricultural production, to tending tree plantations and ornamental flowering plants for parks coming under the Greenery Trust.

SUPPLEMENTARY NOTE III

PLACE OF LANGUAGES IN SCHOOL CURRICULUM IN SELECTED COUNTRIES

1. The *object* of this note is to show the place of the study of languages in the school curriculum in some countries of the world for which school timetables were available.

2. The sources utilized were the following:

(1) *World Survey of Education* published by UNESCO; and

(2) *Data collected by the Commission's* team from unpublished documents available in the office of the UNESCO, Paris.

3. The position regarding the study of languages given in this paper is in respect of students who are university bound. The language load taken by students in terminal courses or by those who desire to adopt a vocational career is generally lighter.

I. AFGHANISTAN

In Afghanistan there are two major languages—Pushtu and Persian. A child whose mother-tongue is Pushtu has to study Persian and vice versa. In addition, one foreign language - English, French or Russian—has also to be studied.

The child begins the study of his mother-tongue in Grade I. In Grade IV he begins the study of the second language. These are the only two languages learnt at the primary stage (Grades I-VI). The study of the foreign language begins at the secondary stage only (Grades VII-XII).[1]

II. AUSTRALIA

English is the only language taught at the primary stage and is continued till the end of the secondary stage i.e., a total period of 12 to 13 years. In addition, most pupils study at least one foreign language, usually French in the secondary school, and the more able may take Latin as well. A few pupils begin a third language in the second year of secondary school, German being the most common.

III. AUSTRIA

Primary education is given either in a eight-year *volksschule* or a four-year *volksschule* from which pupils can transfer to 4-year *hauptschule* (higher primary school). Pupils may transfer to a eight-year general secondary school (*mittelschule*) after four years of *volksschule* or from a *hauptschule.*

German (the first language) is started in Grade I and is taught throughout the 12-year school course. A modern foreign language is taught from Grades V to VIII (of the *hauptschule*). Latin is taught as an *optional* subject in Grades VII and VIII. In addition, provision is made for teaching Esperanto as an optional subject in Grades VI, VII and VIII.

Secondary school is of four types: *gymnasien, realgymnasien, realschule and frauenoberschule.* In addition to German, a modern foreign language is compulsory in all the four types of secondary schools throughout except in *gymnasien* where it is optional in Grades IX to XII.

Latin is begun either in the 1st or in the 3rd year of the 8-year *gymnasien* and *realgymnasien* and taught throughout. Greek is started in Grade IX of *gymnasien.* In the *realschule* a second modern language or Latin is studied as well as the first modern language.

IV. BRAZIL

Primary education consists of 5 years followed by the junior secondary school or *ginasia* of four years and senior secondary school or *colegio* of three years. The senior secondary course offers a choice between a classical and a science stream.

Portuguese is the first language and is taught in Class I to XII compulsorily to all pupils. The teaching of other languages begins at the junior secondary stage and is as follows.

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[1] In order to facilitate comparison, all the classes at the school stage have been numbered consecutively from Class or Grade I to X, XI, XII, etc., as the case may be.

Language	Junior secondary	Senior secondary	
		Classical stream	Science stream
Latin . . .	VI--IX	X-XII	..
Greek . . .	Nil	X-XII	..
French . . .	VI-IX	X and XI	X and XI
English . . .	VII-IX	X and XI	X and XI
Spanish . . .	..	X	X

V. BURMA

The school course consists of ten years, four years of primary, three years of junior secondary and three years of senior secondary. Burmese and English are taught from Class I onwards, the former as the first language and the latter as the second language.

VI. CANADA

The school course in Canada generally follows a 8-4 pattern with often a pre-*university class following, although variations are found from province to province.* English is taught from Classes I to XII. The learning of other languges is provided on an optional basis from the elementary school onwards. At the secondary stage, the second languages offered include French, Latin, German, Italian, Spanish and Greek. Until some years ago, Greek, Latin and possibly two or more modern languages were necessary for university entrance, but such requirements have been gradually dropped, although a second language is still required for entrance to certain faculties or for advanced degrees.

VII. CEYLON

The primary course covers a period of six years. This is followed by a three-year junior secondary stage and two-year senior secondary stage. A further two-year course leading to the senior school certificate gives access to the university.

The mother-tongue (Sinhalese or Tamil as the case may be) is taught from Class I to Class XI (when pupils take the GCE-O level examination). English is introduced in the 4th year of the primary school on a compulsory basis and is taught till the end of school.

VIII. DENMARK

The primary stage consists of 7 or 8 years made up of a first stage of 4 or 5 years (*grundskole)* and a second stage of three or four years (*hovedskole)* of middle school. After the middle school, pupils either go to *realklasse* (one year) or to the *gymnasie* (3 years).

Danish (the first language) is taught from Class I to the end of the secondary stage.

All pupils in the sixth-year class are given compulsory instruction in one modern language—English or German. In the seventh-year class, children considered by the school able to benefit from it, are taught one more foreign language—English or German.

The *gymnasie* which consists of three years, may offer different lines. The language study is of the following pattern:

Language	Gymnasie		
	Classical Language Line	Modern Language Line	Mathematics Science Line
Danish . .	All three years	All three years	All three years
French . . .	,,	,,	,,
Latin . .	..	,,	,,
Greek . . .	,,	..	.
English or German .	..	..	First two years
English and/or German	First two years.	..	

IX FRANCE

In France, French as the mother-tongue and first language, is introduced in Class I and is continued up to the end of the secondary stage (total of 14 years). Additional languages are introduced only at the secondary stage. The first two years of the secondary stage (Classes VI and V) constitute the observation cycle. For the next two years (Classes IV and III), there are three sections—Classical A, Classical B and Modern. Classical A section: main subjects; Greek, Latin, one modern language; Classical B section—main subjects: Latin and two modern languages; Modern section: main subjects: a more intensive teaching of French and two other modern languages.

In the two years of the third cycle (Classes II and I) the languages studied are as follows:

Classical A—Greek, Latin and one modern language.

Classical B—Latin and two modern languages.

Modern—Two modern languages.

The following table gives the languages studied in these classes:

Language	Classical A	Classical B	Modern
Latin . . .	VI to I[1]	VI to I	..
Greek . . .	IV to I	..	..
Modern Language I .	VI to I	VI to I	VI-I
Modern Language II .	..	IV-I	IV-I

[1] Classes at the secondary stage are numbered in descending order in France.

X. FEDERAL REPUBLIC OF GERMANY

German language is taught to pupils from Class I to Class XII (*i.e.* the end of the *Gymnasien*). English is introduced in Class V and continues till Class X (the end of the intermediate or *mittelschule*) or till Class VIII or IX (the end of the primary school).

The *gymnasien* consists of a 9-year course following on from the fourth primary school year and is of three types: the classical academic; the modern academic; and the mathematics and science academic. The classical academic high school gives 9 years of Latin, 6 years of Greek, and 7 years of English or French. The modern academic high school includes 2 modern languages and Latin. The first modern language (generally English), must be studied for 9 years while the second and third foreign languages (7 and 5 years of study respectively) may be Latin and French (or English) or *vice versa*. The mathematics and science academic high school provides for two foreign languages (English and Latin or French). The following table shows the place of languages in the classical, modern and mathematics *gymnasien*.

Languages	Classical *Gymnasien*	Modern *Gymnasien*	Mathematics and Science *Gymnasien*
German . . .	V-XIII	V-XIII	V-XIII
First Foreign Language	V-XII	V-XII	V-XII
Second Foreign Language .	VIII-XIII[1]	XII-XII[1]	VII-XIII
Third Foreign Language . .	VII-XIII[1]	IX-XIII[1]	IX & X

[1] In the upper classes of the classical *gymnasien*, English or French may be chosen as the third foreign language.

XI. INDONESIA

The school course consists of a primary stage of 6 classes and a secondary stage of 6 classes, divided into a junior and a senior stage of three years each.

In the first two classes, the local language (*e.g.* Javanese) is used as the medium of instruction; and Indonesian is introduced in Class III and thereafter becomes the medium of instruction, while the local language is taught as a subject.

In the junior high school, English is introduced in Class VII and is taught to the end of Class XII. The local language is learnt only till the end of Class XI and even that only in the A stream which devotes more time to languages. Provision is also made in this stream for the teaching of old Javanese in Classes X and XI. The mathematics stream provides for the teaching of Indonesian and English in Classes IX to XII while the commerce stream includes the learning of Indonesian, English and German or French all the three years (X-XII).

Language	Primary school	Junior high	Senior high		
			A Stream (Language)	B Stream (Mathematics)	C Stream (Commercial)
Indonesian	III-VI	VII-IX	X-XII	X-XII	X-XII
Local Language .	I-VI	VII-IX	X-XI	..	..
English .	..	VII-IX	X-XII	X-XII	X-XII
German or French .	..	..	..	..	X-XII

XII. IRAN

The school course consists of 12 years, made up of 6 years of primary stage and 6 years of secondary stage. The latter is again divided into a first and a second cycle, each consisting of three years.

Persian (the first language) is taught from Class I to Class XII. Up to the end of the primary stage (Class VI), no other language is taught. In Class VII, Arabic is introduced and is taught for the three years of the first cycle of the secondary stage. A foreign language is also started in Class VII and continued till Class XII.

XIII. IRELAND

The national primary school in Ireland provides a 8-year course, the top two classes really belonging to the secondary stage. The secondary school consists of 6 years, and pupils can transfer from the national primary school either after Class VI or after Class VIII at the appropriate point.

Irish is taught from infant class up to the end of the school course and great emphasis is laid on the Irish language both as a subject and as the medium of instruction, right up to the Leaving Certificate Examination. English is taught compulsorily from Class II onwards as a second language. It may also be learnt in Infant Class and Class I on an optional basis.

XIV. ISRAEL

In Israel, primary stage covers 8 years and secondary 4 years.

In Arab schools, Arabic is the first language and is taught from Grade I. Hebrew is taught from Grade IV and a foreign language—mostly English—from Grade VI. All the three languages are carried through till the end of the secondary school stage.

In certain sections of Hebrew schools the languages studied at the secondary stage are are folows:

Hebrew	IX-XII
First Foreign Language (English or French)	IX-XII
Second Foreign Language (Arabic or Latin)	X-XII

XV. ITALY

The primary course consists of 5 years (*scuola elementare*) followed by the intermediate stage of 3 years (*scuola media*) and an upper secondary stage of 5 years.

Italian—the first language—is taught from Class I and is the only language until Class VI.

In Classes VI to VIII, the languages learnt include Italian, Latin, and starting from Class VII, a foreign language—French, English, German or Spanish.

At the upper secondary stage, pupils study during the first two years—Italian, Greek, and a foreign language (already begun at the *scuola media* stage). During the next three years, the foreign language is dropped. Thus the language study at the school stage can be summarised as follows:

Italian	I-XIII
Latin	VI-VIII
Foreign Language	VII-X
Greek	IX—XIII

XVI. JAPAN

Primary school consists of 6 years followed by a lower secondary school of 3 years and an upper secondary school of 3 years.

Japanese is taught from Class I onwards. No other language is taught at the primary stage.

At the lower secondary stage Japanese continues as a required subject. A pupil may study a foreign language also if he so chooses, as one of the elective subjects.

At the upper secondary stage also, only Japanese language 'A' carrying 9-10 credits is compulsory for all students in all courses, but one or two foreign languages and a classical language (Chinese) may be taken by a student under electives.

XVII. JORDAN

The school course consists of 12 years—6 years of primary school, 3 years of intermediate school and 3 years of upper secondary.

Arabic as the first language is taught in all schools from Class I. English is introduced in Class IV only in English-teaching schools. Both Arabic and English are continued till the end of the secondary stage. No other language is introduced at the school stage.

XVIII. LIBYA

Primary education in Libya covers a six-year course. This is followed by a preparatory or lower secondary stage of three

years and an upper secondary stage of three years.

At the primary stage, only one language is taught, *viz.*, Arabic. This is started in Class I. The first foreign language is introduced in Class VII and the second in Class IX. Generally these are English and French. To pass the secondary school leaving examination the student must secure the minimum prescribed marks in the three languages.

XIX. Mexico

The primary school course in Mexico lasts six years. The secondary course covers five years in two cycles, 3+2.

Spanish is taught from Class I and is continued up to the end of the secondary stage.

In Class VII *i.e.* the first year of the secondary stage, a foreign language—English or French—is introduced.

XX. Netherlands

In Netherlands the Dutch language is taught from Class I and is the only language taught up to Class VI. In Classes VII and VIII which constitute the *continued ordinary primary education*, two out of the three languages—English, French and German—may be added on an optional basis.

The gymnasium or secondary stage lasts six years after six years of primary school. In the fifth year pupils separate into Section A and Section B, the former with emphasis on Greek and Latin and the latter with emphasis on the sciences. The language study is as follows:

Language Studied	Sections A & B
Greek	VII-XII
Latin	VII-XII
Dutch	VII-XII
French	VII-XII
German	IX-XII
English	VII-XII
Hebrew	Optional

XXI. New Zealand

Primary school in New Zealand is of 8 years' duration beginning with the age of 5. The first two years are infant classes, followed by 4 years (Standards 1—4) of primary course and Forms I and II of intermediate department or intermediate school. Post-primary education consists of 5 classes (Forms III to VI).

English is the only language taught at the primary stage and is continued right up to the end of the secondary school as a part of the core programme. French and/or Latin are studied only as electives in the academic or general courses.

XXII. Norway

Primary course lasts seven years in Norway. This is followed by a *continuation school* of one year, or *a folk high school* of 6 months' duration or a *realskole* of 2 or 3 years. A 5-year *gymnasium* course prepares pupils for university entrance, the first two years providing a course similar to that of the *realskole*. It is based on a primary school course, with instruction in a foreign language (English).

Norwegian (mother-tongue and first language) is taught from Class I till the end of the *gymnasium*. English may be taught in Classes VI and VII and is taken by a majority of pupils in urban schools and is taught in a considerable number of rural communities.

In a *realskole*, in addition to Norwegian, English and German are taught for the first two years.

In the *gymnasium*, English is continued up to the end in the case of modern languages side, and up to the end of the penultimate year in the case of the science side. German is studied for the first one year by science side students and for two years by the modern languages side students. French is learnt by all throughout the three years.

Languages Learnt	Primary School (I-VII)	*Realskole* (I-III)	*Gymnasium* (III-V)	
			Science side	Languages side
Norwegian	I-VII	I-III	III-V	III-V
English .	VI and VII (Optional)	I and II	III and IV	III-V
German .		I and II	III	III and IV
French .	..	..	III-V	III-V

XXIII. Pakistan

The school course in Pakistan consists of a primary stage of 5 years and a high school stage of 5 years thus making a total of 10 years except in Sind where it is 11 years.

At the primary stage only one language is taught, namely, the mother-tongue which is Urdu or Bengali. The study of the mother-tongue is continued up to the end of the secondary stage.

English is introduced on a compulsory or optional basis in the middle school (Class VI) and continues up to Class X. A classical language may be taught in Classes VI-X or a modern or foreign language in Classes VI-VIII (French, Persian, Arabic, Bengali, Gujarati, Sindhi).

XXIV. PHILIPPINES

The school course in the Philippines consists of elementary education of 6 grades and secondary education of four.

English and Filipino languages are taught throughout the school course. No provision is made for the learning of any other language—classical or modern.

XXV. POLAND

Primary school consists of a seven-year course and is followed by a four-year general secondary course. Polish language is started in Class I and is continued up to Class XI. The teaching of Russian as a foreign language is introduced in Class V and is taken to the end of the secondary stage. A third modern language or Latin is taught in Classes VIII-XI.

In addition, foreign languages may be studied as optionals at the secondary stage

XXVI. PORTUGAL

Primary school consists of four years followed by a secondary stage of 7 years divided into three cycles (2+3+2).

Portuguese which is the national language, is taught from Class I onwards. No other language is taught at the primary stage. The language study at the secondary stage is as follows:

Language studied	1st cycle Classes V & VI	2nd cycle Classes VII-IX
Portuguese	V & VI	VII-IX
French	V & VI	VII-IX
English		VII-IX

In the third cycle the subjects vary according to the type of course taken. In addition to Portuguese, provision is made for the learning of Latin, Greek, French, English, German.

XXVII. SPAIN

The school course up to university entrance consists of 4 years of primary stage, 4 years of lower *baccalaureate*, 2 years of upper *baccalaureate* followed by one year of pre-university course.

Spanish, the national language, is taught from the primary stage onwards. Language study at the *baccalaureate* stage is as follows:

Language	Lower *Baccalaureate* (VI-IX)	Upper *Baccalaureate* (X-XI)
Spanish	V, VII and IX	XI
Modern Language	VII and VIII	X
Latin	VII and IX	For literature section only X and XI.
Greek		

XXVIII. SUDAN

Primary education consists of 8 years divided into two cycles of 4 years each (elementary and intermediate).

Arabic is taught from Class I onwards. English is introduced as a foreign language in the first intermediate year i.e. Class V and becomes the language of instruction at the secondary stage.

The secondary stage consists again of four years. The teaching of Arabic and English is continued up to School Certificate standard

XXIX. SWEDEN

The primary school consists of seven years sub-divided into a two-year junior school (*smaskola*) and a five-year school (*folkskola*).

The lower secondary school (*realskola*) is a four year course following a six-year primary course. This is followed by the *gymnasium* or upper State secondary school or junior college, consisting of a three-year course. Thus the total span of school education up to the *gymnasium* is 13 years.

Swedish is started from Class I and is learnt throughout the primary stage and in the secondary school. English is an alternative subject in the fifth grade and onwards. It is possible for school districts to choose a time-table without English in case a qualified teacher is not available, but the teaching of English can be considered as normal.

In the *realskole*, English is studied throughout the 4 years, German in the top three classes and French may be taken as an optional subject in the top form, mainly by those who intend going on to the upper secondary school.

At the *gymnasium* stage, the language study may include also Latin and Greek and in certain areas, Spanish, Russian, Finish and Italian (on an elective basis).

XXX. THAILAND

In the primary school, which consists of four classes, the national language, Thai, is taught from Class I upwards. The secondary stage consists of 6 years, a lower and an upper stage. A pupil may also continue in the 3-year primary extension school after the primary stage. After the upper secondary, a student must study the one-year pre-university course before entering the university. In the primary extension school, (Classes V to VII), two languages are studied—Thai and English. The study of these two languages continues through the lower secondary and upper secondary stages.

Foreign languages other than English are introduced only at the pre-university stage both under compulsory and under elective programmes.

XXXI. TURKEY

Turkish is taught from Class I and is the only language taught throughout the primary stage of 5 years. Secondary education comprises 7 years, 3 years of intermediate and 4 years of upper secondary. On entering intermediate school, pupils choose one of the following three foreign languages: English, French or German. The hoice once made has to be continued till the completion of the secondary course.

XXXII. UNITED ARAB REPUBLIC

At the primary stage which consists of 6 years. Arabic is taught from Class I and is continued up to Class XII. No other language is taught during the primary stage. The secondary stage consists of 6 years, 3 years of preparatory secondary or junior high and 3 years of secondary school proper or senior high school. A foreign language is introduced in Class VII—the first year of the junior high school. In the senior high school two foreign languages are introduced in the Region of Egypt and one in the Region of Syria. In the second and third years, two foreign languages are taught in all areas.

XXXIII. UNITED KINGDOM

English is taught throughout the school course. Except in a few private schools, no other language is taught at the elementary stage. In the Grammar schools, children are generally taught a modern European language from Form I to Form V leading to the O level of GCE. A small proportion of students also learn a classical language in addition on an optional basis. Students going in for technical or vocational courses may study no language other than English.

XXXIV. UNION OF SOVIET SOCIALIST REPUBLICS

In the primary school which consists of 7 years, Russian is taught from Class I onwards in schools with Russian as the mother-tongue. In schools with a language other than Russian as the mother-tongue, as for example in Uzbekistan where Uzbek is the mother-tongue or in Ukraine (mother-tongue Ukranian). the mother-tongue is started from Class I and Russian—the national language—from Class II. A foreign language is introduced in Class V in all schools.

The three languages are carried to the end of the secondary stage.

XXXV. UNITED STATES OF AMERICA

A study of English is compulsory throughout the school stage (Classes I—XII). No other language is compulsory. either at the elementary or secondary stages. But several secondary schools provide, and several students opt for one additional language—usually French, German, Spanish, etc.—for 2-3 years, mostly at the senior secondary stage.

XXXVI. YUGOSLAVIA

Primary education consists of eight years. four years of junior primary and four years of senior primary.

The mother-tongue (Serbian, Croation, Slovenian, etc.) is taught from Class I onwards. A foreign language is introduced in Class V and is studied till the end of the secondary stage (Class XII).

At the secondary stage (*Gymnazije*—4 years) a second modern language (English French, German or Russian) may be studied and is encouraged in the last two years at the pupil's option. In addition, Latin is studied during the first two years.

CHAPTER IX

TEACHING METHODS, GUIDANCE AND EVALUATION

I. *Teaching Methods: Discovery and Diffusion*. (2) Scope of the discussion; (4) Elasticity and dynamism; (8) The diffusion of new methods.

II. *Textbooks, Teachers' Guides and Teaching Materials.* (14) Quality of textbooks; (15) State production of textbooks; (18) Programme at the national level; (20) Programmes at the State level; (23) Provision of essential teaching aids.

III. *Class Size.* (27) Present position; (28) Difficulties of teaching large classes; (30) Fixing the maximum class size; (32) Multiple-class teaching.

IV. *School Buildings.* (34) Funds for school buildings; (36) Reduction of costs; (37) Buildings in rural areas; (39) Buildings in urban areas; (40) Expeditious construction; (41) Supervision and standardisation of school buildings.

V. *School Health Services.* (42)

VI. *Guidance and Counselling.* (43) Aims and scope of guidance services; (44) Guidance in primary education; (46) Guidance in secondary education; (51) Other general proposols.

VII. *Search for and Development of Talent.* (52) Significance; (53) Present position; (54) Recommendations; (57) The role of the counsellor.

VIII. *Education of the Backward Child.* (59) Kinds of backwardness; (60) Meeting the needs of slow-learners; (61) Problem of the under-achiever.

IX. *The New Programme of Evaluation.* (66) The new concept of evaluation; (67) Progress of the movement for reform; (69) Evaluation at the lower primary stage; (71) Evaluation at the higher primary stage; (72) Is a primary external examination necessary? (74) A common internal examination for inter-school comparability; (77) Improvement in external examinations; (78) Large incidence of failure; (80) Certificates given by the Board and the school; (82) Establishment of experimental schools; (84) Methods of internal assessment; (87) Higher secondary examination during transition.

9.01. The need for a continual deepening of the school curricula which we examined in the preceding chapter is intimately related to the equally urgent need for a continual improvement in teaching methods and evaluation (inclusive of guidance). We shall devote this chapter to the consideration of some of the important aspects of this programme.

TEACHING METHODS: DISCOVERY AND DIFFUSION

9.02. **Scope of the Discussion.** A good deal of attention has been directed in recent years to the techniques of revitalizing classroom teaching in Indian schools. Basic education was intended to revolutionize all life and activity in the primary school and draw out 'the best in the child—body, mind and spirit'. The Secondary Education Commission devoted an entire chapter in its report to dynamic methods of teaching, discussing the objectives of the right techniques, the values of various activity methods and the different ways in which these methods and techniques could be adapted to suit different levels of intelligence. Considerable efforts have been made during the last decade through seminars, workshops, refresher courses and summer institutes to introduce the teacher, especially at the secondary stage, to new techniques of instruction. The use of audio-visual aids has been on the increase in urban schools, and even television has been brought into the service of classroom teaching in Delhi. And yet it will be generally agreed that the impact of these activities on teaching practices in the vast majority of our schools has not been very significant. The picture is particularly dismal in the rural areas, and especially in the primary schols. In the average school today, instruction still conforms to a mechanical routine, continues to be dominated by the old besetting evil of verbalism and therefore remains as dull and uninspiring as before.

9.03. Why does this happen? The problem is complex and the answers to it are not easy to give. But in our opinion, the following are the four major factors that impede progress:

(1) *The weakness of the average teacher.* By and large, the competence of the average teacher is poor; his general education is below standard and his professional preparation unsatisfactory.

(2) *The failure to develop proper educational research on teaching methods.* Little has been done to find out in crucial sectors, the methods that are best suited to our conditions and needs. For instance, the best methods of teaching beginning reading in a

phonetic script like Devanagari have yet to be developed.

(3) *The rigidity of the existing educational system.* Better methods of teaching are discovered, not so much through educational research, as through the adventures of gifted teachers who have the courage to get off the beaten track. Our educational system is not designed to encourage initiative, creativity and experimentation on a large scale and is, therefore, not able to keep itself abreast of the times.

(4) *The failure of the administrative machinery to bring about a diffusion of new and dynamic methods of teaching.* Even assuming that a good method of teaching is discovered and is actually introduced in a few progressive schools, the problem still remains of diffusing it among the other schools so that it becomes the common practice in the educational system as such. This is a difficult task, and we have yet to find the right techniques for accomplishing it.

The first of these problems has already been discussed in Chapters III and IV and the second is dealt with in broad terms in a subsequent chapter[1]. We do not propose to examine here the methods of teaching different school subjects as there is a good deal of pedagogical literature available on these topics. It is our considered opinion however, that the failure to modernize our teaching methods is very largely due to the third and fourth factors stated above—the rigidity of the educational system and the administrative failure to diffuse even known and practised methods among the schools. We shall address ourselves mainly to these two problems in the course of this chapter.

9.04. **Elasticity and Dynamism.** In a modern society where the rate of change and of the growth of knowledge is very rapid, the educational system must be elastic and dynamic. It must give freedom to its basic units—the individual pupil in a school, the individual teacher among his colleagues, and the individual school (or cluster of schools) within the system to move in a direction or at a pace which is different from that of other similar units within the system without being unduly hampered by the structure of the system as a whole. In this process, the freedom of the teachers is the most vital; it is almost synonymous with the freedom of the school, for the pupils can rarely be freer than the men and women who teach them. It will, therefore, be quite in order to equate the elasticity and dynamism of an educational system basically with the freedom of teachers.

9.05. It has to be remembered that advances in classroom practice never occur on a broad front, with all the teachers and all the schools moving forward in unison. In a school system with a large number of untrained or poorly trained teachers, there is need for a solid framework of detailed syllabuses, textbooks, examinations, frequent inspections and well-defined rules. The average teacher who wants security rather than opportunity for creativity may welcome this support. But the work of the best teachers can be crippled if they are not permitted, encouraged and helped to go beyond the departmental prescriptions. The success of an educational reform will depend upon this flexible approach where the good school or the good teacher is able to go ahead and the necessary supports are provided to the weaker institutions to introduce the reform gradually. The task of the administrator or inspector in such a situation becomes very difficult. He cannot take the easy line of imposing common restrictions on all or be daring enough to give equal freedom to all. We expect him to analyse the strengths and weaknesses of each school and of each school teacher and to help them make the best progress they can. One of the essential conditions for making an educational system elastic and dynamic, therefore, is for the administrator to develop this competence, to discriminate between school and school, between teacher and teacher, and to adopt a flexible mode of treatment for individuals or institutions at different levels of development. This alone can help to promote initiative, creativity and experimentation on the part of the teachers.

9.06. Certain general conditions are necessary to promote this elasticity and dynamism, some of the more important of which are given below:

(1) The individual teacher is most likely to try bold changes in teaching practice if there is a feeling of reform in the air and if he sees his small contribution as part of a major social revolution.

(2) The experimenting teacher must have much more than the passive acquiescence of the school inspectors. He must feel that officers of the Education Department are

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[1] Chapter XII.

personally eager to see experimentation and that they are willing, within reasonable limits, to accept a proportion of failures as part of the price.

(3) The inspectors are the key figures in any reform of classroom practice. They are *Authority,* present and obvious. They should be consulted from the beginning, should know that their criticisms and suggestions carry weight, and should be made to feel that the proposed changes are, in some measure, *their* reforms. A school system can be no more elastic or dynamic than the inspectors will let it be. This is why the in-service education of inspecting officers assumes great significance.

(4) The sympathy and support of headmasters and senior teachers must be won quite early in the programme if they are not to dampen all youthful ardour to experiment and explore. They may not want to break new ground themselves. But if they do not feel they are being by-passed and that the new system is not being foisted on them, they can become its patrons, if not its practitioners. There is also much to be gained by winning the approval of teachers' organizations to any movement that increases flexibility in the school system. Individuals will experiment more readily if they feel that experimentation has the general support of the profession.

(5) Anything that breaks down the isolation of the teacher increases his sense of assurance and makes it easier for him to adventure. The strengthening of the teacher's sense of inner security is a purpose common to all the methods advocated to increase the elasticity or dynamism in a school system. It is the basis of all real reform in teaching practice. There are occupations where a mass advance can be achieved by the invention of new equipment and the issuing of instructions for its use. No worthwhile advance is possible in teaching method unless the individual teacher understands what he is doing and feels secure enough to take the first new steps beyond the bounds of established practice. It is easier for a teacher to do so in a small group than when he is working alone. The success of 'team teaching' in introducing new teaching techniques into some American schools is based on the fact that it is not the individual but the team that is responsible for the planning and execution of new methods. It is our belief that the proposed organization of a school complex[1] in which the teacher works in a cooperative group is more likely to help flexibility than the present system of isolation.

(6) Nothing reduces a teacher's sense of security or his willingness to take advantage of freedom so seriously as does his ignorance of the subject-matter he has to teach. If he is only a few lessons ahead of his class he dare take no risks, and finds safety in the old routine of rote memorizing. Increasing the teachers' level of general education is, in general, the surest way of ensuring that some of them will adopt livelier and more meaningful methods of teaching. Fortunately, the limiting factor is not so much the absolute amount of knowledge the teacher has but the gap between what he knows and what his pupils know. Consequently, the easiest place to introduce innovations is in Classes I and II. There is also a great advantage in taking the lowest classes of the school as a starting point for reform, since it is at this level that the greatest 'pupil-wastage' occurs through repetition and drop-out.

(7) When in doubt, teachers will teach in the way they were taught themselves and not in the way they were told to teach. So, if a school system is to become more flexible and teaching methods more lively and varied, it is essential that these qualities be established very early in the *practice,* as well as in the *theory,* of at least some of the teacher training institutions. A few training institutions at both the primary and the secondary levels should become centres for devising, testing, and adapting methods and materials to be used in the schools.

(8) A teacher or institution will be able to introduce innovations more easily if the parents of the pupils know enough about their purpose so as not to have any fear that they will interfere with their children's chances at the final examination. A strong and respected headmaster or teacher can probably best win over the parents by his own efforts; but in most cases, it will be necessary for the Department to help in convincing parents that changes in methods are desirable and officially approved.

(9) Innovations are more likely to occur if there is a ladder of promotion up which the bright young teacher can hope to climb by outstanding service.

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[1] See Chapter II for details.

(10) Obviously, elasticity or dynamism will be increased if there is a reasonable provision of books, teaching materials, and services that will enable some children to undertake part of their work alone or in groups. There is a limit to what can be expected of the most imaginative teacher if all he has is a bare room, a blackboard, a standard textbook, and sixty pupils. The most pressing needs for a teacher who wants to branch out on new methods are, therefore, a good supply of books and paper, and particularly at the lower levels of school education, some simple tools and materials for making equipment. If some teachers in the more poorly equipped schools are to have a real chance to make use of any freedom they are given, it would seem desirable to have, at the disposal of the district education officer, a sum of money, not too tightly bound up by regulations that might be used, with discrimination, in providing the minimum facilities and services to certain schools and teachers who show a special willingness and capacity to adopt new methods and standards of teaching. The amount of such aid should never be so great as to make any experiment expensive, unreal, and incapable of being applied widely. Too many 'pilot projects' are conceived on such an elaborate scale as to irritate teachers in the average schools and to be of little value to the system as a whole.

9.07. If measures like those described above can be taken, schools and teachers will have opportunities to venture forth on their own and try out new ideas and experiments. Of course, those that will actually utilize this freedom will be few. But it is these few teachers and schools whose work will put dynamism into the system as a whole and help in raising standards, in breaking new ground and in continually adapting the system to the demands of a changing society.

9.08. **The Diffusion of New Methods.** Elasticity in a school system is obviously of limited value unless the good practices developed by a few adventurous teachers or schools are spread more widely through the system as a whole. Unfortunately, this is by no means an automatic process in education, where successful experiments frequently die with the men and women who started them, and where the natural rate of spread of even the more viable innovations is measured in decades rather than in years. It takes a great deal of administrative skill and perseverance to get bold new methods understood and accepted by the body of average and below average teachers, even when they have amply proved their value—and firm proofs of success are hard to produce in education. The difficulties are multiplied ten-fold when teachers are expected to accept, not just a new technique for achieving the old ends, but methods that embody in themselves a new concept of the very purpose of education. That is why it is such a long and burdensome task to convert a school system based primarily on memorization into one involving understanding, active thinking, creativity and what has come to be called 'problem solving'. Each step is not a step but a leap into the unknown, and the average teacher needs skilled and detailed help, and—what may seem to be a contradiction in terms—sympathetic goading if he is to make it at all. This is precisely the problem that we have to face and solve during the next ten to twenty years.

9.09. How can this be done? Very little systematic research has been undertaken on the diffusion of classroom practices even in the educationally advanced countries, and practically none in developing countries. The earlier researches of Paul Mort and his colleagues at Columbia University seemed to show that a period of 25 to 40 years was necessary in the United States for anything like full diffusion of a new practice, but the rapid spread of such innovations as the PSSC[1] Physics course (which started in 1957, and is now taken by about fifty per cent of the high school pupils studying physics in the United States) has shown that, under certain conditions, the period can be greatly reduced. This experience and some others of its type seem to indicate that the educational administrator can encourage and hasten the diffusion of new teaching practices in a number of ways, the more important of which are indicated below:

(1) Almost all the factors which render the system elastic enough for the outstanding teacher to break new ground will also make it easier for the mass of average teachers to follow his example. However, mere permissiveness on the part of the authorities will not do the trick. They will need to play a more active part, with something that comes nearer to persuasion

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[1] Physical Science Study Committee.

than to pressure but which still leaves no doubt in the teachers' minds that the Education Department and its officers favour certain changes. But it must be done with sensitivity and moderation, or the teachers will come to regard the new methods as the Department's latest fad, and may try to apply them, with or without understanding, to the detriment of the normal work.

(2) The main body of teachers will accept new methods more readily if the immediate goals set before them are limited ones. This means that the methods devised by the brilliant teacher or the subject specialist may have to be approached by stages, and that the stage demanded of each group of teachers may vary with their ability.

(3) The usual devices for in-service training such as refresher courses, workshops, demonstrations, exhibitions of work, and visits of quite long duration (days not hours) to see the new methods at work in pioneering schools should be adopted on a large scale. Used with discrimination and skill, films, tapes or radio can bring whole lessons to quite isolated schools, not so much for their effect on the pupils as to give the teachers a model of good teaching practice.

(4) Itinerant instructors, specialized in certain subjects, class-levels of techniques, and working under the general direction of the District Education Officer, are even more vital at the stage of diffusing new methods than at the stage of the first experiments with them.

(5) Probably the quickest and most effective way of having new theories accepted is to embed them in the 'tools' of teaching—textbooks, teachers' guides, and teaching aids of all kinds. Some teaching of theory is, of course, still essential. But it springs *from* proposed practices instead of floating airily *above* them. The extent of the theory and the degree of detail with which the practices are set out will vary with the level of general education of the teachers. In the initial stages of development and with weaker schools, it might be necessary for teachers' guides to go into a fair amount of detail on the series of lessons to be arranged throughout the school years, the methods to be used, the teaching aids to be prepared, the activities to be encouraged, and the tests and techniques of evaluation to be employed.

9.10. The technique referred to in the preceding paragraph may be described as the laying down of 'tramlines' on which the average teacher can move forward with confidence in his teaching. This method is different from the traditional practice under which the teacher is given lectures on general principles and is then expected to apply them with no more aid than is given by a mediocre textbook that often clashes with the very principles that are being advocated. It is, of course, the administrator's responsibility to ensure that, while providing 'tramlines' for the mass of the teachers, there is still enough freedom left for the bold few to travel more freely. But with this precaution, there is no doubt that these 'tramlines' of progress *are* the techniques that will be particularly effective for diffusing new methods.

9.11. It is obvious that this laying down of tramlines is not a 'once and for all time' business—it requires continuous renewal. When an administrator lays down a set of tramlines with immense effort (it takes some years to do so), he generally finds that his 'progressive' tramlines have become a new 'orthodoxy' and that he will have to start laying them down once again and that there will be the same old resistance for breaking away from the earlier tramlines. But that is an inevitable and perennial problem that every educational reformer must face. The provisions made to enable the outstanding teachers to leave the tramlines will help the rest also to leave them in course of time, while the more adventurous teachers will go still further ahead to fresh woods and pastures new.

9.12. It will be seen that the essence of our recommendation is that only an elastic and dynamic system of education can provide the needed conditions to encourage initiative, experimentation and creativity among teachers and thereby lay the foundations of educational progress. We firmly believe that the risks of freedom and trust in teachers that are implied in this approach are not greater than those of undue restriction and distrust and they are more worth taking. We should learn to delegate authority, to trust our teachers, to encourage the capacity for leadership amongst them, to treat every institution as having a personality of its own which it should try to develop in an atmosphere of freedom. This would need dynamic leadership at all levels, determined to give education a new deal and to make every teacher, educational officer and administrator put in the best of himself in this great co-operative endeavour.

TEXTBOOKS, TEACHERS' GUIDES AND TEACHING MATERIALS

9.13. The value of the textbook as an effective tool of learning and of diffusion of improved teaching methods has been indicated in the preceding section. A good textbook, written by a qualified and competent specialist in the subject, and produced with due regard to quality of printing, illustrations and general get-up, stimulates the pupils' interest and helps the teacher considerably in his work. The provision of quality textbooks, and other teaching and learning materials, can thus be an effective programme for raising standards. The need to emphasize it is all the greater because it requires only a relatively small investment of resources. Moreover, a quality book need not cost appreciably more than one that is indifferently produced.

9.14. **Quality of Textbooks.** Unfortunately, textbook writing and production have not received the attention they deserve. In most school subjects, there is a proliferation of low quality, sub-standard and badly produced books, particularly in the regional languages. This has been due to a number of factors among which mention may be made of

- the lack of interest shown by top ranking scholars so that the writing of textbooks has been generally done, in actual practice, by persons whose abilities are far from equal to the task;
- the malpractices in the selection and prescription of textbooks which defy control;
- the unscrupulous tactics adopted by several publishers;
- the lack of research in the preparation and production of textbooks; and
- the almost total disregard by private publishers (who are interested only in profits) of the need to bring out ancillary books, such as teachers' guides to accompany textbooks.

9.15. **State Production of Textbooks.** As education began to spread, the textbook industry became one of the very profitable fields for investment and the evils of the type mentioned above became more and more conspicuous. The attention of State Governments was soon drawn to them and it was decided that, in order to eliminate them, the State Governments should take over the production of textbooks. At present, most State Governments have adopted this policy and taken over the production of textbooks. The extent to which this responsibility has been assumed shows considerable variations—some States have produced only a few books at the primary stage while others have produced all books till the end of the secondary stage. In one or two States, not only production but even distribution and sale of textbooks have been taken over by the State.

9.16. There have been some definite gains from this policy. Private profiteering has disappeared and prices have been kept low. The malpractices and intrigues which used to be so common a feature of what used to be called the 'textbook racket' have also disappeared. The quality of books has improved in several instances, although the general level of the books still remains poor and their standard does not often come up to what some of the well-established and efficient publishers are doing. The main reason for this failure is that the Education Departments which have taken over the responsibility of textbook production have not adequately organized themselves for it. It is this weakness that is largely responsible for the shortcomings one often sees in the State-produced textbooks, *viz.*, failure to revise books for long periods, misprints, poor production, failure to supply books in time, etc. We do not desire to underestimate these deficiencies. What we want to highlight are two points: the first is that these weaknesses do not lead to the conclusion, as some interested parties are ever eager to show, that State-production of textbooks is wrong; and the second is to emphasize the urgency for the Education Departments to organize themselves properly for this great educational responsibility they have undertaken.

9.17. State-production of textbooks, it must be noted, is only one step in the direction of improving the quality of textbooks. But by itself, it can achieve little and if adequate steps are not taken in time to organize the activity on right lines, it may even put the clock back. We, therefore, recommend that emphasis should be placed on developing the programme of textbook production on right lines. Some concrete suggestions from this point of view are made in the paragraphs that follow.

9.18. **Programme at the National Level.** It is essential that the best talent available in the country should be brought together to produce the textbooks and other literature needed, both at the school and at the university stages. This can only be done at the national level by agencies set up by the Government of India.

(1) For the university stage, the Ministry of Education is bringing out a series of low-priced and subsidised books in collaboration with appropriate authorities in the USA, the USSR and the UK. This is a useful scheme and its significance has now become even greater. It should be expanded and vigorously developed, along with schemes for books written by Indian authors. We lay great emphasis on the latter schemes. We recommend that as a matter of national policy, nearly all books at the undergraduate stage including those for professional subjects, should be by Indian authors. In the preparation of these books, fullest use should, of course, be made of foreign sources. This goal should be capable of realization within 5 to 10 years.

(2) At the school stage, we welcome the steps taken by the NCERT to produce textbooks with the help of scholars available in the country. Some books have already come out; and more will come out soon. These books are meant for use by State Governments who can use them with or without changes. We hope that the State Governments will make full use of this pioneer venture to improve the quality of their books.

(3) The production of textbooks and allied materials at the national level will be greatly facilitated if the Government of India were to establish, in the public sector, an autonomous organization, functioning on commercial lines, for the production of textbooks. We have recommended the establishment of similar organizations at the State level also. But there will be a large number of books, especially in the scientific and technical sector, which can only be produced on a national basis. It would also be desirable to produce several other categories of books at the national level, either for reducing cost or for improving quality or for purposes of national integration. We, therefore, feel that an organization of this type at the national level is urgently needed. We recommend that the Ministry of Education should set up a small committee to work out the details of this project and take all the necessary steps to bring it into existence as early as possible.

9.19. Textbooks produced at the national level will have other advantages as well. One of our major recommendations[1] is that we should make an attempt to evolve national standards at the end of the primary, lower secondary and the higher secondary stages. The definition of these standards as well as the organization of a programme for their practical implementation will be greatly facilitated by the production of textbooks at the national level. Such books can indicate the expected standard of attainment far more precisely than any curricula or syllabi; and their practical use in schools is the surest method to raise standards and make the teaching in schools in the different parts of the country fairly comparable. In a subject like mathematics or science, for instance, there is not much scope for local variations and the adoption of common textbooks in all parts of the country is not only feasible, but also desirable from several points of view. The same can be said about a common textbook in citizenship prepared from the point of view of national integration and used in all schools of the country. History is another difficult subject to teach, especially from the point of view of social and national integration: and authoritative well-written books on the subject can be of immense help to all teachers. At present, there is hardly any common book which all the students in India read: and that is one of the reasons why our educational system contribute so little to national integration. On the other hand if we had, say, a set of 100 books on different topics written by the best of our scholars which would be translated and be available in *every* school and if an average student were expected to read them in his school course as a matter of routine, the entire thinking of the rising generation would be different and national integration could be immensely strengthened.

9.20. **Programmes at the State Level.** While attempts to improve textbooks at the national level are thus welcome, they cannot be the sole attempts for this crucial reform. Their most effective service is to stimulate other centres into activity and especially to promote similar enterprise at State levels. We recommend that each State should organize an adequately manned expert section for the production of textbooks for schools. They should make as much use of the work done at the national level as possible. But there is no escape from the fact that each State will have to produce several textbooks in areas where national books will not be available. Even in areas where national books are available, independent attempts by the States will stimulate each other and the Centre itself. We can hope for the best results only when the national and all the State centres for textbook production are functioning actively and in close collaboration.

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[1] Chapter X.

9.21. The following points should be kept in view by the State Education Departments in organizing their programmes of textbook production:

(1) A separate agency, preferably functioning on an autonomous and commercial basis, should be set up, in close liaison with the Education Department for the production of textbooks and teaching aids. It would be extremely difficult, if not impossible, to have within the four walls of usual departmental procedures, the autonomy and freedom which such an undertaking essentially needs.

(2) Production of textbooks is a continuous process. For instance, it takes a year or even more to produce a textbook and a further year for try-out and revision. Within a year of its adoption on a large scale, a process of evaluation has to start; and very soon thereafter, it will be discovered that it needs revision. The machinery set up, therefore, should be adequate to follow all these steps for *every* textbook. It should be an objective of policy to see that a textbook is continuously revised and kept up to date and that a thorough revision takes place at least once in five years, if not oftener. The need for frequent revisions of textbooks is obvious, even if the curricula were to remain unchanged. But we do visualize, as stated in the last chapter, a continual deepening of the curricula. In fact, very often a revision of textbooks will be necessitated, not by a revision of curricula, but as a means of changing and deepening them.

(3) No useful purpose is served by having only one textbook in a subject for a given class—this is almost invariably the position under the existing programmes of nationalization. It should be an important objective of policy to have at least three or four books in each subject for each class and leave it open to the teachers to choose the book best suited to the school. This is necessary even if there were to be a common syllabus for all the schools. We have recommended, however, that there should be more than one approved syllabus and that each school should be permitted to adopt the syllabus best suited to its own conditions. In such a case, a multiple choice of books should be available for each syllabus.

(4) When Government gets books written, the payment to authors is often so niggardly that the ablest scholars are not generally attracted. This is the one point where private enterprise often scores over State-produced textbooks. It is, therefore, necessary to adopt liberal policies for remuneration, comparable to those of the private trade, and to attract the best people to write books.

(5) State-production of textbooks is not to be used for purposes of earning profits[1]—its sole purpose is to produce the best books and to make them available to the children at the lowest cost. The entire organization should, therefore, be run on a no-profit and no-loss basis. The sales of State-produced books, however, are so large and certain, that even when no profit as such is charged and the price is merely rounded off to the nearest five paise, large margins are left over and these are enough to cover the costs of research, overhead establishment and the preparation of ancillary aids like teachers' guides.

(6) The incentive to write books should be encouraged in as many quarters as possible. Apart from commissioning selected persons to write textbooks, which will have to be done in many cases, the Departments should also invite manuscripts, proposals, etc., and be ever on the hunt for new talent. There should be high level committees of professional persons to judge books or proposals submitted; and approved books should be adopted by the Departments and published after making suitable arrangements with the authors.

(7) Special encouragement should be given to teachers to write textbooks; in the USSR, even the highest positions in universities can be obtained by writing outstanding textbooks. Our universities can follow this example. We also suggest that learned societies should give adequate professional recognition to outstanding textbooks.

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[1] In one State, we found that 100 per cent profit was charged while fixing the price.

(8) Good textbooks are not enough; they should be supplemented by teachers' guides and other instructional material. A teacher's guide, as we have mentioned above, should give detailed assistance to teachers. Even for graduate teachers in the United States, some of the new courses being evolved in mathematics, science and social studies contain a great deal of detailed suggestions. The poorly educated and insecure teacher tends to drop into a dreary routine in which every lesson is taught in the same way, and he needs quite detailed suggestions on a variety of methods, which can make his teaching more lively and effective. It is only with the help of such detailed framework of support and guidance that a large number of teachers, particularly in the primary schools will get off the beaten track.

9.22. There are really three aspects to the textbook production programme:

(1) *Academic* aspect which includes the preparation of textbooks, try-out and evaluation;

(2) *Production* aspect which includes all matters relating to printing and publication; and

(3) *Distribution* aspect which includes storage, sales, etc.

The first is the most important aspect, and the responsibility for it will have to be squarely accepted by the State Education Departments on the lines we have recommended above. The second is discretionary. We find that some State Governments have accepted direct responsibility for it and established separate textbook presses. This is the direction in which we should move. The third is really self-contained and is not inseparably linked with the first two. In one State where the State Government had assumed direct responsibility for distribution of textbooks, we found that the precious time of a number of field officers was taken up by sales, accounts and stock-keeping. We recommend that this activity should be promoted through student cooperatives which every educational institution (or group of educational institutions) should be encouraged to establish, and that it should not be assumed directly by the Education Departments.

9.23. **Provision of Essential Teaching Aids.** In assessing the needs of the teacher from the point of view of teaching methods, one is forced to admit that in the majority of schools, particularly at the primary stage, there is still an almost total absence of basic equipment and teaching aids—a good blackboard, a small library, essential maps and charts, simple science apparatus, and necessary display materials. The supply of such basic equipment and teaching aids to every school in the country is essential for the improvement of the quality of teaching. It would indeed bring about an educational revolution in the country. We recommend that lists of minimum teaching aids and equipment needed by each category of schools should be prepared. These may be kept as economical and frugal as possible. But once a certain minimum equipment is considered necesseary, steps should be taken to see that it is given to every school on a high priority basis. As in Madras State, the help of the local community could be harnessed in developing this programme. As a first step, we recommend that a good blackboard should be immediately given to all schools.

9.24. Several suggestions were made to us to the effect that we should adopt new techniques of teaching which are now coming into use in the advanced countries. These techniques involve the large scale use of films, radios, tape-recorders and other audio-visual aids, the introduction of open and closed circuit television, and the provision of language laboratories, programmed instructional methods and simple and highly sophisticated forms of teaching machines. With regard to the use of films, filmstrips and other simple audio-visual equipment, it may be possible to make these teaching aids available to every school complex (and through it to every school even in rural areas). In this connection, we invite attention to the Report of a Study Group on Classroom Science Films (their recommendations apply to the teaching of other subjects also) with which we broadly agree[1]. In addition, it should also be possible to equip the majority of upper primary and secondary schools with low cost radio sets. We recommend that Education Departments should work with the All India Radio for the use of radio lessons, supplemented with printed material for the teachers, and, if possible, for the pupils. We also recommend the broadcasting of special radio talks, in the early morning or late evening specially designed for teachers which will help to deepen their subject knowledge and guide them in lesson preparation. The more sophisticated forms of the newer techniques, however, can be used, generally speaking, at this stage of our educational development only on an experimental basis and in a few schools. It has to be remembered that schools cannot use an equipment which is much beyond the level of technology in the society. Sophisticated equipment given to rural schools, for instance, cannot be maintained and soon falls into disrepair. A few progressive schools may be equipped with new aids like language laboratories and programmed instructional material; but such techniques may preferably be tried out, in the first instance, in the education and training of teachers.

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[1] For details, see Supplementary Volume I, Part V.

9.25. The majority of teachers in our schools will have to rely on inexpensive teaching equipment which are easily available in the locality or are made by them with proper encouragement and little financial assistance. The programmes that will help us most, in the immediate future, in improving the teaching in our schools are, therefore, the following:

(1) The training of teachers in the use and preparation of simple and improvised teaching aids;

(2) The use of the school workshop—and also of programmes of work-experience—to prepare the teaching aids required by the school itself and by other schools in the neighbourhood;

(3) Manufacture of simple equipment on a large scale for reducing cost, and its distribution to schools; and

(4) Sharing the more costly equipment in common by schools in a given neighbourhood. For instance, a group of schools in the neighbourhood may have a projector in common. A good laboratory in one school can be used, according to a carefully prepared plan, by other schools nearby. A group of schools may have a circulating library; and so on.

CLASS SIZE

9.26. It will be generally agreed that there cannot be a marked improvement in methods of teaching if the teacher is required to teach very large classes as a matter of routine. The phenomenal expansion of primary and secondary education in recent years has resulted in overcrowding in schools, especially in urban areas, where accommodation is not easily available for the extension of the school building or the opening of new sections. The class size sometimes grows to abnormal proportions. A class of sixty children is a common sight in a city. We ourselves have seen, in the course of our tour, classes of sixty and even sixty-five children in a few secondary schools. Quite often, the classroom is not able to accommodate easily such a large number. The problem is solved by pushing the teacher's chair—there is no place for a teacher's desk—into a corner and bringing the front benches almost up to the blackboard! In conditions like these all talk of creative teaching ceases to have any significance.

9.27. **Present Position.** Tables 9.1 and 9.2 show the sizes of classes at different school stages, on the basis of information supplied by the State Governments for 25 districts selected from eight States in a special study carried out by the Commission.

TABLE 9.1. DISTRIBUTION OF TEACHERS IN LOWER PRIMARY SCHOOLS/SECTIONS ACCORDING TO THE NUMBER OF PUPILS THEY TEACH (1965)

State	Percentage of teachers teaching pupils								
	Below 10	11—19	20—29	30—39	40—49	50—59	60—69	70 and above	TOTAL
	%	%	%	%	%	%	%	%	%
Andhra Pradesh	0·4	6·3	18·5	24·3	21·9	12·5	6·3	9·8	100·0
Kerala	0·2	1·9	31·7	30·8	11·8	4·2	3·4	16·0	100·0
Madhya Pradesh	3·6	14·0	23·8	23·9	15·5	7·9	4·2	7·1	100·0
Mysore	0·7	4·7	13·3	21·5	21·8	13·5	7·7	16·8	100·0
Orissa	1·7	10·4	17·9	30·0	20·1	9·8	4·9	5·2	100·0
Punjab	0·2	2·6	10·1	27·3	28·4	18·2	8·4	4·8	100·0
Rajasthan	1·0	7·0	16·6	17·1	11·7	9·2	6·2	31·2	100·0
Uttar Pradesh	1·0	6·5	15·1	20·6	19·9	13·9	8·8	14·2	100·0
ALL-INDIA	0·9	6·1	18·7	23·8	18·6	11·1	6·5	14·3	100·0

TABLE 9.2. SIZE OF CLASSES/SECTIONS AT HIGHER PRIMARY AND SECONDARY STAGES (1965)

Class	Percentage of sections/classes with enrolment								
	Below 10	10—19	20—29	30—39	40—49	50—59	60—69	70 and above	Total
	%	%	%	%	%	%	%	%	%
VI	9·5	17·1	20·8	23·6	15·8	5·8	2·2	5·2	100·0
VII	9·9	18·9	20·1	20·4	14·5	4·7	1·5	4·0	100·0
VIII	3·9	11·3	15·5	25·7	24·3	11·5	2·5	5·3	100·0
IX	7·8	4·0	10·8	21·8	31·5	13·6	4·7	5·8	100·0
X	0·7	7·4	16·3	25·9	29·9	11·0	2·8	6·0	100·0
XI	2·0	11·8	21·8	19·5	15·4	10·8	6·0	12·7	100·0
XII	0·9	8·0	14·1	15·1	25·2	16·4	8·4	11·9	100·0

The tables are very revealing. We find that 11.1 per cent of the teachers at the lower primary stage teach classes of 50-59, 6.5 per cent take classes of 60-69 pupils, and 14.3 per cent have to deal with classes of 70 pupils and more. Some of these classes will be, of course, in single-teacher schools, where one teacher has to take two, three and sometimes even five combined classes. Similarly, at the higher primary and the secondary stages, the position is not much better. The percentage of teachers handling classes of 50 to 70 pupils and above is 13.2 in Class VI, 10.2 in Class VII, 19.3 in Class VIII, 24.1 in Class IX, 19.8 in Class X, 29.5 in Class XI and 36.7 in Class XII. It will be seen that the number of teachers handling such large classes increases as we go up the educational ladder.

9.28. **Difficulties of Teaching Large Classes.** Methods of teaching in classes of fifty pupils and more cannot be satisfactory. However capable a teacher may be, he cannot pay individual attention to a large number of children, give special assistance to the weaker ones, guide the brighter ones to proceed at a faster pace in an attempt to help one and all to reach the maximum of their capacities. In these circumstances the average teacher will be tempted to resort to rote memorization. Assignments given will generally not be checked and composition exercises will be marked during periods of spasmodic energy. The poor quality of teaching in the ordinary secondary school in urban areas may partly be attributed to overcrowded classrooms.

9.29. We do not, however, support those educational theorists who contend that a class should not have more than twenty or twenty-five pupils. It would be extremely unrealistic for our teachers to think in terms of this ideal. There is indeed no such thing as an ideal class size, and there is no sanctity about the number twenty-five or twenty. In our country, classes of a somewhat larger size than what may be strictly considered as desirable cannot be avoided for a long time to come. Some of the educationally advanced countries are also facing a similar problem. Teachers should reconcile themselves to the acceptance of this inescapable necessity. It is also the responsibility of the training institutions to have a more practical approach to the problem and to evolve methods which would help the teachers to teach classes of this size without a complete abandonment of all pedagogic principles.

9.30. **Fixing the Maximum Class Size.** However, beyond a certain number, it is not possible to extend the class size without doing serious damage to the quality of teaching. This is particularly true at the high school and higher secondary school stages, where individual differences become more marked, special help has to be given in many more cases, and the assignments to be attended to increase in number. We are of the opinion that it is not enough to fix the average pupil-teacher ratio at the different stages of school education. Such a ratio is necessary, of course, to determine the number of teachers required with reference to the enrolments. But it will not necessarily control the class size. We may have a ratio of 40 pupils to one teacher at the primary stage and yet find a class of 10 pupils and another of 80 pupils perhaps in the same district. It is essential that, in addition to the pupil-teacher ratio, the maximum number of pupils to be admitted in a class must also be prescribed, and this maximum should not be allowed to be exceeded in any case. We recommend the following maximum number for the different stages of school education:

Lower Primary	—	50
Higher Primary	—	45
Lower Secondary Higher Secondary	—	40

9.31. The class size in Classes I and II has a special significance. More than half the enrolment at the primary stage is in these two classes; and very often, they are large classes of 60 or more. In such cases, our first recommendation would be that the needed teachers should be provided and the class size reduced as indicated above. But if this were not possible, we would prefer to break this class into two classes of about 30-35 students and engage them only for three hours a day and request the teacher (with payment of a suitable allowance) to engage two such classes per day. This would be a far better method of education than the present system of herding together 70 or so pupils in one class and keeping them there for six hours a day.

9.32. **Multiple-Class Teaching.** About 40 per cent of our schools are single-teacher schools and even in other schools, the proportion of big schools where one teacher teaches one class is very small. More than half of our teachers, therefore, have to teach more than one class at a time. This will be seen from Table 9.3.

TABLE 9.3. DISTRIBUTION OF TEACHERS IN PRIMARY SCHOOLS/SECTIONS ACCORDING TO THE NUMBER OF CLASSES THEY TEACH (1965)

State	One Class	Two Classes	Three Classes	Four Classes	Five Classes	Total
	%	%	%	%	%	%
Andhra Pradesh	35·9	27·7	16·9	4·5	15·0	100·0
Kerala	83·5	14·1	0·6	1·8	..	100·0
Madhya Pradesh	30·5	26·1	17·4	8·5	17·5	100·0
Mysore	50·9	21·4	3·7	24·0	..	100·0
Orissa	43·0	29·6	26·2	0·7	0·5	100·0
Punjab	46·4	26·9	14·8	1·1	10·8	100·0
Rajasthan	10·1	20·8	26·2	18·6	24·3	100·0
Uttar Pradesh	36·5	35·9	19·6	2·5	5·5	100·0
TOTAL	43·7	25·6	14·2	8·4	8·1	100·0

Source. State Governments.

Note. The information is based on statistics collected from 25 districts in 8 States.

In a situation of this type, research in multiple-class teaching is badly needed; and training institutions have to make a special effort in orientating teachers to the special techniques that have to be used under such conditions.

SCHOOL BUILDINGS

9.33. The provision of school buildings is extremely unsatisfactory at present. At the primary stage, only about 30 per cent of the schools are stated to have been housed in satisfactory buildings. The corresponding proportion at the secondary stage is stated to be about 50. This shows the great backlog of unconstructed school buildings which has to be cleared during the next few years. In addition, buildings will have to be provided for the additional enrolments which will come in with increasing speed. The problem, therefore, has three aspects: (1) provision of the necessary funds; (2) reduction of the building costs to the minimum level possible; and (3) the devising of a suitable machinery which can implement the programme expeditiously and economically.

9.34. **Funds for School Buildings.** We recommend that the allocations for construction of school buildings in the Central and State budgets should be increased. This is one area where the local community can make a significant contribution. Schemes of grant-in-aid should, therefore, be devised under which assistance from the State will be available to local communities, on a basis of equalization, for the construction of school buildings. Wherever possible, loan programmes for the construction of buildings should be encouraged. Grant-in-aid and loans should also be available to private schools, on a fairly liberal basis, for building construction[1].

9.35. **Reduction of Costs.** A number of committees have examined this question for both the Central and State Governments, on behalf of the Ministry of Education, the Ministry of Works and the Planning Commission. In addition, the UGC has prepared detailed norms for hostels, staff quarters, libraries, etc., and the Central Building Research Institute at Roorkee and the Indian Standards Institute have made recommendations in this area. The result of all these is that there exist, for most types of schools and colleges, space and planning norms and type plans and a good deal of sound advice that can help in reducing costs. What is required now is a mechanism that will put this information into practice.

9.36. In view of the acute shortage of traditional classical building materials and the shortage of accommodation, many schools are today operating in what are classified as 'temporary constructions' by the PWD and some even in thatched huts. We find that there is a strong prejudice against such structures. In our view this prejudice against the use of 'temporary' buildings or thatched huts for school purposes is totally unjustified. Designed and constructed with a raised floor and high doors and windows with plenty of ventilation, these structures serve more than adequately as school buildings. This should not, however, be misunderstood to imply that kachha buildings are always better. This is not so; and some kachha buildings prove costlier in the long run because of heavier costs of maintenance. What we wish to emphasize is the need to accept well-planned kachha structures as part of our system and to highlight simplicity and utility rather than ostentation in the construction of buildings.

9.37. **Buildings in Rural Areas.** The problem of school buildings needs to be discussed separately for urban and rural areas. In the former case, land values are high; and very often enough land is not available at all. Sophisticated structures are, therefore, necessary, even in order to keep in tune with the immediate environment. In the rural areas on the other hand, land is cheap and readily available; and sophisticated structures often look grotesque in a village atmosphere.

9.38. We recommend that everything should be done to encourage local initiative and local contribution in cash, kind or labour for the erection of schools. A special device that can be of great use is that government should supply only the framework —which can be pre-fabricated—and the local people should be expected to raise the plinth and fill up the walls. The 'nucleus' approach recommended by the Ministry of Education will be of great help and deserves to be generally adopted.

9.39. **Buildings in Urban Areas.** In urban areas, the following steps should be taken for achieving economy in the construction of educational buildings:

(1) *Judicious Selection of Specifications and Local Materials.* The existing practice of playing safe by adopting conventional

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[1] We have used the expression 'school buildings' to include all eductional buildings such as classrooms, libraries, laboratories, cycle sheds, hostels and residential quarters for teachers.

specifications is not conducive to economical construction. Economy can be achieved through the selection of locally available materials, use of cheaper materials, omission altogether of certain finishes and acceptance of a lower standard of construction. In all these steps, the governing factors would, however, be the availability of materials, climatic conditions, safety of buildings and recurring costs on maintenance.

(2) *Techniques of Construction.* With careful planning and designing, even the so-called 'temporary' structures can be made to serve a better purpose than many of the rented buildings in which schools are often housed. Such structures should be built, wherever climatic and other conditions permit. If pucca buildings are absolutely necessary, an increasing reliance is needed on the improved techniques of construction such as the use of framed structures, cavity walls, pre-fabricated components, RCC frames for doors and windows and components evolved by the Central Building Research Institute and other research organizations.

9.40. **Expeditious Construction.** In order to expedite the construction of school buildings, the following steps are recommended:

(1) *Rural Areas.* In rural areas, there are no local contractors available. Contractors from urban areas generally charge higher rates when they are required to work in villages. The departmental machinery is also not adequate to reach most of the outlying villages. For the construction of village school buildings, therefore, we recommend that the agency of the local communities or village panchayats should be utilised to the fullest extent possible.

(2) *Urban Areas.* In urban areas, we recommend that the local agencies like municipalities and corporations should be utilised fully for construction of school buildings. They have the necessary technical staff and can also contribute towards the cost of such buildings. If the responsibility for providing buildings for local schools is placed on municipalities and if a suitable system of grant-in-aid is devised, the progress in this sector would be accelerated.

9.41. **Supervision and Standardization of School Buildings.** For construction of government school buildings, to assist the voluntary organizations for the purpose, to supervise the general programme of construction of school buildings in a State, and continually to introduce improved and economic techniques, we recommend the adoption of the following additional measures:

(1) *Formation of Educational Building Development Groups.* Each State should have an Educational Building Development Group within the Public Works Department but working in close association with the Education Department and consisting of an architect, an educationist, an administractor, a civil engineer and a cost accountant, all working on a full-time basis (with power to co-opt representatives of special technical skills) whose main function would be to improve the planning and construction of government school buildings and whose advice should be available for private schools also. There should also be a Building Development Group working at the Centre, for effectively coordinating the working of State-level Groups.

The functions of the Groups will be (a) to study building requirements in the light of new teaching techniques, (b) to develop in cooperation with manufacturers new building techniques and specifications, (c) to evolve functional and economic type plans for various types of educational buildings, (d) to arrive at a correct assessment of costs of materials and labour required, (e) to conduct field trials, (f) to evaluate the plans, specifications and building techniques already in use; and (g) to study methods of maximising the use of indigenous materials. The Group at the centre could profitably bring out a journal highlighting the latest techniques of construction, and researches at home and abroad on conventional buildings.

The State Governments should ensure that the recommendations of these Development Groups are followed.

When the Groups in the different States are well established, the possibility of making them function within a rigid framework of 'maximum cost per place and minimum standards' as is being successfully done in the United Kingdom, should be explored.

(2) To avoid delays in the construction of government buildings a separate unit of PWD should be set up for execution of educational buildings programmes.

(3) *Formation of Educational Building Consortia.* After the Educational Building Development Groups have standardized the

plans and the technique of construction, the possibility should be examined of establishing Education Building Consortia, (on the lines of similar associations, popularly known as CLASP, in the UK) to exploit fully the advantages of industrialized buildings.

(4) *Standardization.* Layouts, dimensions, specifications and methods of construction for any particular region should be standardized by the Educational Buildings Development Group mentioned above so that mass production of the different components on a factory scale can be undertaken resulting in economy as well as speed of construction. Considerable work in the field of standardization has been done by organizations like the Indian Standards Institute which could serve as a basis for further studies.

(5) *Buildings for Private Schools.* The economy measures worked out by the Educational Building Development Group in each State for reducing the cost of educational buildings should be made known to the managements of private educational institutions in the State, and the grant-in-aid given to a private management for a building should be subject to upper cost limits worked out.

School Health Services

9.42. The provision of school health services (including school meals) is of great importance. The problem has recently been studied by the School Health Committee under the chairmanship of Shrimati Renuka Ray. We broadly agree with the recommendations of the Committee.

Guidance and Counselling

9.43. **Aim and Scope of Guidance Services.** Guidance services have a much wider scope and function than merely that of assisting students in making educational and vocational choices. The aims of guidance are both adjustive and developmental: it helps the student in making the best possible adjustment to the situations in the educational institution and in the home and at the same time facilitates the development of all aspects of his personality. Guidance, therefore, should be regarded as an integral part of education and not a special psychological or social service which is peripheral to educational purposes. It is meant for all students, not just for those who deviate from the norm in one direction or the other. It is also a continuous process aimed at assisting the individual to make decisions and adjustments from time to time.

9.44. **Guidance in Primary Education.** Guidance should begin from the lowest class of the primary school. It can be used in helping pupils to make a satisfactory transition from home to school; in diagnosing difficulties in the learning of basic educational skills; in identifying pupils in need of special education (*e.g.*, the gifted, the backward, the physically handicapped); in helping potential drop-outs to stay in school; in guiding pupils to develop insight into the world of work and favourable attitudes towards work; and in assisting in plans for their further education or training. Little has been done so far in the shape of guidance services at the primary stage because of the large numbers of institutions involved, the poor qualifications of the teachers and the absence of resources. It would therefore, be unrealistic for a long time to come to think of providing qualified counsellors in these schools. Some guidance functions can, however, be performed by well-trained primary school teachers. Community resources can also be mobilised to meet some of the guidance needs of the young pupils.

9.45. Suggestions for making a beginning in guidance in the primary school are outlined below:

(1) The training programme for primary school teachers should include familiarizing them with simple diagnostic testing and with the problem of individual differences and the implications of these differences for classroom practices

(2) There should be at least one lecturer in the training school who should be able to deal with the subject of principles of guidance and mental hygiene.

(3) Guidance services should be introduced in the training institutions and in schools attached to the institutions so that the trainees may get first-hand knowledge of the problems involved in their organization.

(4) Wherever possible short in-service courses in guidance should be provided for primary school teachers.

(5) Simple literature for the occupational orientation of children may be prepared and made available in the regional langauges.

(6) At the end of the primary stage, children and parents should be helped in the selection of courses for further education, and the selection should not be based on the examination results alone.

9.46. **Guidance in Secondary Education.** One of the main functions of guidance at the secondary level is to aid in the identification and development of the abilities and interests of adolescent pupils. It helps these pupils to understand their own strengths and limitations and to do scholastic work at the level of their ability; to gain information about educational and vocational opportunities and requirements; to make realistic educational and vocational choices and plans based on a consideration of all relevant factors; and to find solutions to their problems of personal and social adjustment in the school and the home. Guidance services also help headmasters and teachers to understand their students as individuals and to create situations in which the students can learn more effectively.

9.47. Following the recommendations of the Secondary Education Commission, the Ministry of Education set up a Central Bureau of Educational and Vocational Guidance in 1954 to give technical advice and help to the nascent guidance movement in the field of secondary education. Guidance became a centrally-sponsored scheme in the third plan and 13 Bureaus have now been set up for the development of guidance services in the States. These Central and State-level organizations have developed a modest programme of guidance, and services are rendered to the pupils in the schools by trained counsellors and career masters with the help of the teachers. By the end of the third plan, the number of schools offering some kind of guidance was about 3,000, which constituted only about 13 per cent of the total number of secondary schools in the country. Again the majority of these 3,000 schools have only a career master on the staff and offer only an information service. Very few institutions have a full-time or part-time counsellor for giving effective guidance help, including testing and counselling.

9.48. It is thus clear that though there is an organized movement for providing guidance services, the progress made has been very slow. The ultimate objective should of course be to introduce adequate guidance services in all secondary schools, with a trained counsellor in charge of the programme. Since, however, neither financial allocations nor training facilities for guidance will be available on such a large scale, it is necessary that a short-range programme should be adopted for the next 20 years. We, therefore, recommend the following:

(1) A minimum guidance service should be made available to all secondary schools by having one Visiting School Counsellor for every ten schools located within a reasonable distance of one another, and by allocating the simpler guidance functions to the teachers.

(2) At the same time, in order to demonstrate what a really comprehensive guidance service is like and what it can achieve, it would be desirable to set up comprehensive guidance services in a few carefully selected schools, preferably one in each district.

(3) The necessary supervisory staff to inspect and offer consultation to the school workers should be appointed in the State Bureaus of Guidance.

9.49. We believe it is necessary that all secondary school teachers should be given some understanding of guidance concepts and simple guidance techniques as a part of the programme intended for every trainee. Special or advanced courses should be provided for those who wish to study the subject in depth. Every training college should have on its staff a person having at least the training considered essential for school counsellors. Provision should exist for the in-service training of the training college staff in guidance and counselling.

9.50. Adequate arrangements should be made for the professional training of guidance workers. The training of career masters may be undertaken by the State Bureaus as well as the training colleges with the collaboration of the vocational guidance officers of the National Employment Service. Professional courses of longer duration should be offered by the universities. Until such courses are started, it may be necessary for the older State Bureaus which have been offering this programme to continue to do so. As the number of persons capable of conducting training programmes for guidance workers is extremely limited, higher level training programmes in guidance to prepare qualified guidance workers to undertake training and research should be initiated at the national level.

9.51. **Other General Proposals.** (1) Programmes for the development of guidance literature, occupational information materials, films and filmstrips, and psychological tests, need to be accelerated, care being given to avoid duplication of effort through increased communication among agencies working in these fields. Co-ordination of efforts should characterize all guidance programmes.

(2) Schools should be assisted in providing hobbies and recreational activities as well as part-time employment opportunities for their students. These should be organized in such a manner as to provide meaningful experiences for the students, which will enable them to explore and develop their interests and abilities.

(3) In addition to the training and extension programmes in guidance mentioned earlier, emphasis should be laid on research pertaining to guidance in the Indian situation.

Search for and Development of Talent

9.52. **Significance.** A dearth of competent and trained manpower is now felt in nearly every branch of national life, and is probably one of the biggest bottlenecks to progress. Poor as we are financially, the poverty of trained intellect is still greater. We might do well to remember Whitehead's warning: 'In the modern world the rule is absolute—any race which does not value trained intelligence is doomed'.

9.53. **Present Position.** Native intelligence is generally distributed equitably throughout the population. If it is duly discovered and developed, our large population can be our most valuable asset. Unfortunately, very little of the available talent is now discovered and developed, due to several adverse factors:

- In a large majority of the homes, the environment is deprivatory on account of the illiteracy of the parents and poverty, and does not allow the available native talent to develop itself fully.
- A good deal of potential talent never enters school. At the primary stage, the proportion of children not enrolled varies from 10 to 60 per cent in different areas. Even among those who enter, about 40 per cent are eliminated in Class I itself and only about 25 per cent belonging to about the top 20 per cent of families in the society, complete primary education. Secondary education is largely a privilege of the top 10 per cent of the families and higher education of the top 5 per cent.
- Even the talent that enters school and succeeds in climbing the educational ladder does not flower fully because it is not discovered sufficiently early and is often studying in poor schools. For obtaining the best results in quality, talent has to be located early and allowed to grow in the best atmosphere and under the best teachers.
- We still try to determine talent by considering total marks obtained in an examination. This is a very ineffective method. The highly gifted students are far too creative to be confined within the perimeters of classroom instruction, textbooks and examinations. The genius in one field is generally poor in several others and, in our examination system, a genius is more likely to fail or put up only a mediocre 'total' of marks than to come out at the top: Ramanujam and Tagore could not even pass the routine examinations where mediocrities shone. We should, therefore, search separately for each special talent, whether in mathematics, science, literature, fine arts, sports or technology.

It is not an easy thing to identify gifted students, except perhaps in mathematics and to some extent, in science. Sustained and energetic research is needed. But as talent is the most valuable asset a country can have, the returns will be immense. Moreover, the search for talent must be a continuous process and has to be taken up at all stages. The secondary stage, however, is the most crucial; and a reference has already been made to the manner in which universities can help in the identification of gifted students at this stage and help them to develop.[1]

9.54. **Recommendations.** Elsewhere, we have made several proposals which will assist in this programme for the discovery and development of talent. The provision of five years of good and effective primary education to every child will enable the country to cast its net for talent to the widest extent possible.[2] The large programme of scholarships proposed at all stages will ensure that all gifted students, or at least the top 5 to 15 per cent of the relevant age-group, will be enabled to receive the highest education possible.[3] The placement programme which we suggest will also make it possible for them to study in the best institutions available at each stage.

9.55. In addition to these programmes, it is also necessary to introduce enrichment programmes for the brighter students in as many schools as possible and ultimately in every school. The performance of talented students in the enrichment programmes should be recorded in special certificates which will indicate to the colleges or other institutions of higher education their special abilities and attainments. Care should be taken to ensure that the enrichment programmes do not degenerate into coaching for passing examinations with higher marks The flexibility in the school curriculum that we have proposed in the preceding chapter would enable the schools to provide enriched or advanced courses for the talented and help them to progress at their own speed. This will also release time for teachers to help the average and backward students.

9.56. A variety of extra-mural programmes can also be organized for the talented students, either separately by each school or by schools acting in cooperation or by the Education Departments. For instance:

(1) A five to six-week summer vacation programme can be arranged for a group of academically talented children from different schools, brought together to an educational centre having special facilities of staff, library, laboratory and equipment. The programme may be renewed for the particular group from year to year, so that the students get an opportunity to develop their special talent over a number of years.

(2) Well planned visits may be arranged to laboratories, museums, and other places.

(3) Talented students may be brought into contact with persons engaged in the types of work for which the students show special ability or interest. These persons may be able to provide occasional opportunities for the students to work in their special fields.

(4) Hostels or Day Centres may be made available for those students whose home environment is not conducive to proper study.

In planning for the development of the talented student, it should be remembered that it is not only his intellectual competence or special ability that needs to be developed. The development of the emotional and social aspects of his personality, and of socially desirable attitudes, is also very important.

9.57. **The Role of the Counsellor.** The role of the counsellor in the promotion of talent can be very important. The counsellor with his detailed knowledge of each talented student is in a unique position to formulate a programme of enrichment for him and to suggest the necessary modifications in the curricular and extra-curricular requirements. Where special counsellors are not available, this task will fall on the teachers. It will, therefore, be necessary to train teachers for this responsibility through in-service seminars and special courses. It should be impressed on them that the classroom atmosphere and the attitudes of teachers is of considerable importance. In a social and educational set-up like ours where the relationship between the teacher and the taught is still largely authoritarian, the general tendency is to suppress any urges and interests that deviate from the class norm. The first requirement for the promotion of talent, therefore, is for the teachers to create an atmosphere of free expression in the classroom and to provide opportunities for creative work.

EDUCATION OF THE BACKWARD CHILD

9.58. With the rapid expansion of educational facilities, the number of backward children in schools is also increasing. Many of them drop out of schools at one stage or another, either because of their inability to satisfy the academic standards or the boredom and frustration they feel in the pursuit of an academic programme which is largely unrelated to their needs and interests. Though quite a few of these children manage to enter high school or even college, their performance continues to be very poor.

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[1] Chapter II
[2] Chapter VII
[3] Chapter VI

9.59. **Kinds of Backwardness**. Backwardness is largely due to one of two reasons which sometimes overlap: (1) mental handicap or low intelligence, arising from hereditary or congenital factors or disease or injury; (2) under-achievement or inability to perform up to the level of one's intelligence, especially in persons intellectually well endowed, frequently due to emotional conflict, lack of motivation, poor study habits, cultural deprivation and economic handicaps. On the basis of studies made in educationally advanced countries, it is estimated that seventy-five per cent of the backward children belong to the first category, usually referred to as the mentally handicapped, and the remaining twenty-five per cent belong to the second category, usually designated as the "under-achievers. In our case, the latter category would be obviously much greater. Both these categories of pupils, for different reasons, are unable to profit from normal education. The result is a wastage of educational facilities and of human resources, neither of which a developing country can afford.

9.60. **Meeting the Needs of Slow Learners.** The mentally handicapped are generally classified into four groups: the idiots; the imbeciles; the educable mentally handicapped morons; and the dull or slow-learners. The first three groups of backward children, who have an intelligence quotient below 75, cannot benefit from formal education in ordinary classes. Suitable provision should, however, be made for the education of the dull, who on account of their slower rate of mental development, cannot learn at the ordinary pace of normal children. In the ordinary classes, where instruction is traditionally geared to the needs of the average child, the dull have to work under a great hardship. They need individual attention, special remedial help and probably also a modified curriculum to suit their rate of learning. In big cities, it may be possible to establish special schools for them as has been done in some educationally advanced countries, but in most cases, special classes in the ordinary schools and individual tuition to the extent possible are the only general remedy. Such a treatment is likely to be better for their proper emotional and social development also.

9.61. **Problem of the Under-achievers.** The group of under-achievers consists of children who are not intellectually dull, but are at least of average and may even be of superior ability. The failure of such children should be of great concern to a developing country like ours, which cannot remain indifferent to this loss of potential manpower within the higher ability range. Several factors—physical, intellectual, emotional and environmental—contribute to the failure of the under-achiever to come up to the level of his latent abilities. The first step is to diagnose the causes of this failure by observation, interrogation and the application of psychological tests, if possible. Such a collation of data will make it possible to have a total appraisal of the situation and indicate lines of remedial treatment.

9.62. Once the child's errors and difficulties are located, a remedial programme should be formulated and carried out. The remedial programme should aim at correcting the basic errors, raising his attainment level in the subject or subjects, re-establishing his confidence in himself and in his ability to succeed, and creating for him new interest and motivation in his studies. The remedial measures should involve the student himself as much as possible and should be organized individually or in small groups. The assessment of the student's progress should be made not against any external standards but with reference to his own previous performance Remedial programmes are particularly needed in reading, spelling and number work in the earlier stages, and in language and computational skills in the later stages

9.63. Since these educationally retarded children are not under-achieving because of innate low mental capacity, their needs can be met by remedial arrangements within the school system. What the student requires is help for a limited period and within a limited area of study. This may be done by assigning the responsibility to one or two interested teachers during specific periods in the week. Where child guidance clinics exist—and this is a very limited facility at present—the help of highly trained personnel will be available for a group of schools at regular intervals. Remedial groups could also be set up after school hours, two or three days in the week, with subject specialists in charge of each group.

9.64. Guidance and counselling services have an important role to play in the education of the backward, especially with regard to identification of the group, diagnosis of their special defects and planning for their education and future occupation. But these services have not been developed and the programme has to be carried on with whatever help and guidance can be given by the teachers in the school. The essential factor for the success of the programme is the coordinated approach that the entire school faculty should make to the problem of these children with a degree of sympathy and understanding and with an insight into child psychology born out of long experience. The teacher should ordinarily be able to give some help to the under-achievers. Parent-teacher associations should be mobilized for enlisting the cooperation of parents in dealing with special cases. It is necessary, however, that there should be at least one child guidance clinic in each major town, and it should be adequately staffed. Serious cases of backwardness should be referred to these clinics for diagnosis and remedial help.

THE NEW PROGRAMME OF EVALUATION

9.65. The evils of the examination system in India are well known to everybody. The baneful effects of the system on education in general, and secondary education in particular, have been discussed in the reports of several committees and commissions. The Secondary Education Commission, after reviewing these defects at the secondary education stage, recommended a new approach to school evaluation and made a number of concrete proposals for the improvement of the external examination and the methods of internal assessment. As a result of these proposals, a movement was started for examination reform, which gathered momentum with the establishment of the Central Examination Unit of trained evaluation officers by the Government of India in 1958. The outstanding feature of the new reform movement is the emphasis laid on the modern concept of evaluation, which has found increasing acceptance in educational circles in India in recent years.

9.66. **The New Concept of Evaluation.** It is now agreed that evaluation is a continuous process, forms an integral part of the total system of education, and is intimately related to educational objectives. It exercises a great influence on the pupil's study habits and the teacher's methods of instruction and thus helps not only to measure educational achievement but also to improve it. The techniques of evaluation are means of collecting evidence about the student's development in desirable directions. These techniques should, therefore, be valid, reliable, objective and practicable. As the common method (and often the only method) of evaluation used at present in India is the written examination, a natural corollary of the acceptance of the new approach will be to improve the written examination in such a way that it becomes a valid and reliable measure of educational achievement. There are, however, several important aspects of the student's growth that cannot be measured by written examinations, and other methods such as observation techniques, oral tests and practical examinations, have to be devised for collecting evidence for the purpose. These methods need to be improved and made reliable instruments for assessing the student's performance and educational development.

9.67. **Progress of the Movement for Reform.** During the seven years of its existence the Central Examination Unit has made a multipronged attack for the popularization of the new concept and techniques of evaluation. It has worked with thousands of secondary school teachers in seminars and workships, introduced hundreds of training college lecturers to the new techniques, established a very large pool of test items, trained paper-setters attached to different Boards of Secondary Education, published a good deal of literature on evaluation and carried out or sponsored several studies and investigations on various practical problems in examinations. As the work of the Unit expanded, the Government of India approved of the establishment of Evaluation Units in different States during the third plan period. So far, State Evaluation Units have started functioning in 12 States and one Union Territory.

9.68. But the task is a stupendous one, and it will take considerable time for the new measures to make their impact on objectives, learning experiences and evaluation procedures in school education. The improvements already made in the external examination by the different Boards have not removed all its major defects. The objectives have not yet been enlarged to include the testing of application and problem-solving abilities. The character of the school examinations, at least in the senior classes, is determined largely by that of the external examination, and the new techniques of evaluation are not readily adopted in these internal examinations. Moreover, all the efforts in the direction of reform have been confined to the field of secondary education. No attention has been paid to the improvement of examinations at the primary stage, and hardly any to the problems in this area at the university stage.

9.69. **Evaluation at the Lower Primary Stage.** One of the main purposes of evaluation at the primary stage is to help the pupils to improve their achievement in the basic skills and to develop the right habits and attitudes with reference to the objectives of primary education. These objectives and their implications for evaluation should be made clear to the teachers. As has been suggested in an earlier chapter, it would be desirable to treat the lower primary stage covering Classes I to IV as an ungraded unit, because this would help the children coming from different backgrounds to advance at their own pace. As the conditions in most primary schools, however, are not favourable to the general adoption of this procedure, we have recommended that the experiment should be tried out in the beginning in Classes I and II, which should be regarded as a single ungraded unit. This will put an end to the existing practice of detentions in Class I and the drop-outs and wastage resulting therefrom, and will also provide for continuity and flexibility in the educational programme of the first two classes. The two-year block may be divided into two groups, one for slow-learners and the other for fast-learners to enable different pupils to proceed at the level of their ability and move from one unit to another. Such a division, however, will be practicable only in a large-sized school with more than one section in each class. If the experiment regarding the ungraded unit suceeds in Classes I and II, it may be extended to the remaining classes of the lower primary stage.

9.70. Teachers should be prepared for the ungraded system through the regular training courses and orientation programmes and should be helped with a supply of diagnostic tests and remedial material. The orientation may be given by the State Institutes of Education. Observation techniques, which are more reliable for assessing the pupil's growth at this stage than mere formal techniques of evaluation, should be used by teachers in a planned and systematic manner.

9.71. **Evaluation at the Higher Primary Stage.** At present evaluation in these classes is carried out largely by means of written examinations. We believe that due importance should be given here also to oral tests, which should form a part of the internal assessment. The teacher should be helped in such assessment with a rich supply of evaluation materials prepared by the State Evaluation Organizations, including standardized achievement tests[1]. Diagnostic testing is necessary here and indeed throughout the school stage. In most cases, such testing will be through simple teacher-made diagnostic tests. Cumulative record cards play a vital role in indicating the growth and development of the pupil at each stage, his academic and emotional problems, and his difficulties of adjustment, if any, and the directions in which remedial action is to be taken to solve his problems or difficulties. We are of the opinion that cumulative record cards intended for the primary classes should be very simple, so that primary teachers can use them with just a little training. In the first instance, the cards should be introduced from Class IV onwards in about 10 per cent of selected schools as an experimental measure; but once the majority of teachers are trained in evaluating certain important aspects of the child's personality and the proper maintenance of the records, the use of the cards may be gradually extended to all the higher primary and, as a next step, even to lower primary schools.

9.72. **Is a Primary External Examination Necessary?** An external examination at the end of the primary stage (Class VII or VIII) to be taken compulsorily by all pupils was strongly recommended by some witnesses who appeared before the Commission. We were informed that some of the States which had abolished the external examination at the end of this stage had either re-introduced it or proposed re-introducing it in the near future. It was pointed out that an external examination was necessary for (1) maintaining certain uniform standards at the end of the stage; (2) providing a basis for choice of courses at the secondary stage; and (3) creating incentives for better teaching and learning. But all these arguments do not establish a case for an external examination of the formal type to be compulsorily taken by all the pupils in Class VII or VIII Though we have recommended elsewhere that the first national standard of attainment should be defined at the end of the primary stage, we do not think it necessary or desirable to prescribe a rigidly uniform level of attainment for all the primary school pupils in a State or even in a district, through an external examination. Moreover, instead of creating incentives for better teaching, the external examination intended for all will saddle teachers with standardized programmes and encourage the process of rote memorization, which is the besetting evil of teaching and learning methods in our schools today. Again, since full-time education at the lower secondary stage will provide, by and large, general education without any streaming, the argument regarding the choice does not hold good; and for the diversion of pupils to full-time vocational courses to be made available at this stage, an examination which will merely test intellectual ability and academic attainment will not be of much help. We, therefore, recommend that no compulsory external examination should be held at the end of the primary school stage.

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[1] This programme is discussed in Chapter X.

9.73 While we are not in favour of a compulsory external examination, we believe that for the proper maintenance of standards, periodic surveys of the level of achievement of primary schools is necessary. We recommend that such surveys should be conducted by the district educational authorities to assess the standard of performance of the schools in a given area by means of standardized or highly refined tests prepared by specialists in the State Evaluation Organizations. This procedure will enable the education officers to pick out the weaker schools and help them to improve their performance. It will also assist the schools in finding out the weakness of their pupils for purposes of remedial work.

9.74. **A Common Internal Examination for Inter-school Comparability.** By making use of the standardized or refined test material referred to above, the district educational authorities may, if they so desire, arrange for a common examination to be taken by the pupils of all the schools in a district at the end of the primary stage. This common school leaving examination will be different from the school certificate examination now held in many States, because though the question papers will be set by the district educational authorities or by special paper-setters appointed by the State Evaluation Organization, the performance of the pupils of each participating school will be assessed by the teachers of the school themselves, and not by any external examiners. The advantages of such a common final examination for the primary schools are obvious. As the question papers will contain standardized tests and highly refined and professional test items, the evaluation will be more valid and reliable than what is possible through the kind of annual and final examinations conducted in the ordinary primary school. Moreover, through such common tests inter-school comparability with regard to levels of performance in the district can be obtained, and this would be helpful, as shown above, both to the education officers and to the schools. We would like to emphasize that the question papers in the different subjects at this common examination should be of short duration, each of not more than one hour or one hour and a half, so that the entire examination should be completed in two or three days.

9.75. The whole purpose of the proposal is to reform the existing examination by making it less formal, reducing its burden on the pupils' minds, and increasing its validity as a measure of educational attainment. The school at the primary stage plays the determining role in the total assessment of such attainment. The certificate regarding the completion of the course should be given by the school and not by the external agency, and this certificate should be accompanied by a statement showing the results of the common final examination if any, together with the results of the internal assessment made by the school of the pupils' performance throughout the year, as shown in his cumulative records.

9.76. In addition to the common examination, special tests may be held at the end of the primary course for the award of scholarships or certificates of merit or for the purpose of identifying talent and pupils may appear for these tests on a voluntary basis. The evaluation of the pupil's performance in these tests will be done by external examiners.

9.77. **Improvement in External Examination.** At present in the case of the higher secondary class or the intermediate classes located in the school, the external examination is held by the State Board of Secondary (or Higher Secondary) Education, and in the case of pre-university class, the examination is held by the university concerned. We have recommended that the pre-university classes now located in affiliated colleges should be transferred to schools as higher secondary classes in a phased programme spread over ten years, and that the duration of the higher secondary course should be extended to two years everywhere by 1986[1].

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[1] Chapter II

When these classes are located exclusively in the schools, the Board of School Education will conduct the external examination at the end of Class XI (or Class XII) as well as that at the end of Class X. In the transitional period the present dual control will continue. What we state below applies to all external examinations at the school stage, whether they are at present conducted by the Boards or by the universities.

(1) Most of the weaknesses in the present system of external examinations are due to defects in the questions and the question papers set for the examination. The paper-setters are, by and large, appointed on the basis of seniority, subject competence, and experience in teaching. Very few of them possess the necessary knowledge and skill in the construction of valid and reliable tests. We are of the opinion that no major break-through towards the improvement of external examinations is possible unless (a) the technical competence of paper-setters is raised through an intensive training programme sponsored by the State Boards; (b) the question papers are oriented to testing not merely the acquisition of knowledge but the ability to apply knowledge and the development of problem-solving abilities; and (c) the nature of the questions asked is improved.

(2) Apart from the improvement of questions and question papers, many other procedures of the external examinations need to be made more systematic and scientific. For example, the marks of different subjects are added without being standardized. The determination of cut-off points, the award of grace marks and other similar methods are also not based on any sound rationale. All these factors tend to make the examination scores less and less reliable. It is essential that scientific scoring procedures should be devised so that there may be optimum reliability in the assessment of the candidate's performance.

(3) With the ever-increasing number of students appearing for the Board examinations, the task of getting the answer scripts properly valued and of processing the results efficiently within a given time is becoming more and more difficult. It is necessary that this process should be mechanized so as to make it more accurate and expeditious.

9.78. **Large Incidence of Failures**. The matter about which the public at large is most deeply concerned is not the irrationality of the scoring procedures or the inefficiency of the administrative processes, but the large incidence of failures in the external examination at the end of the school stage. An analysis of the results of the different Board examinations for the last five years show that about 55 per cent of the candidates appearing for the high school examination and about 40 per cent of those appearing for the higher secondary school examination fail regularly every year[1]. In the case of the private candidates the percentage soars up to 70 or even more. Failure often has a demoralizing effect on the unsuccessful candidate. The failure of such large numbers of students, particularly after they have been screened year after year by means of annual and other school examinations, is a sad reflection on our methods of education as well as on our system of examination.

9.79. There is no doubt that if the measures suggested above for the reform of the external examination are properly implemented the situation will gradually change in the years to come. We also believe, that with the proposed improvement in the curriculum, instructional materials and methods of teaching and the reorientation in the training of teachers, the incidence of examination failures will be reduced. But we do not think that a student should be branded as a total failure, if he passes in certain subjects but is unable to make the grade in others. There is no reason why he should carry with him the stigma of being declared an unsuccessful candidate if he has partially succeeded in his educational effort.

9.80. **Certificates Given by the Board and the School**. We recommend that the certificate issued by the Board on the basis of the results of the external examination at the end of the lower or higher secondary stage, should give the candidate's performance only in those subjects in which he has passed, but there should be no remark to the effect that he has passed or failed in the whole examination. The Board, however, should issue a statement along with the certificate showing his marks or grades in all the subjects. We further recommend that the candidate should be permitted to appear again, if he so desires, for the entire examination or for separate subjects in order to improve his performance.

9.81. On the completion of the course, at the end of the lower or higher secondary stage, the student should receive a certificate from the school also giving the record of his internal assessment as contained in his cumulative record card. This certificate may be attached to that given by the Board in connection with the external examination, but we are of the opinion that the external examination need not be compulsory for all the students of Class X or Class XI/XII. A student may choose to leave the school with the school certificate only without appearing for the external examination, and seek a job or even an entry into some vocational course on the basis of the certificate and the school records. It must be recognized, however, that since admission to institutions of higher secondary education as well as of higher education will be selective, the authorities controlling such institutions will lay down their own rules of eligibility for admission. A student seeking entry into these institutions may have not only to pass the external examination in the subjects laid down and secure the prescribed grades but also submit himself if necessary to certain admission tests required by the institutions.

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[1] Supplementary Volume I, Part V.

9.82. **Establishment of Experimental Schools.** We have suggested certain measures above for reducing the domination which the external examination exercises over school education. In order to lessen its importance still further, we recommend that a few selected schools should be given the right of assessing their students themselves and holding their own final examination at the end of Class X, which will be regarded as equivalent to the external examination of the State Board of School Education. The State Board will issue the certificates to the successful candidates of these schools on the recommendation of the schools. A committee set up by the State Board of School Education should develop carefully worked-out criteria for the selection of such schools. The schools should not only be freed from the requirements of an external examination but should be permitted to frame their own curricula, prescribe their own textbooks, and conduct their educational activities without Departmental restrictions.

9.83. This is a bold step in the direction of freedom and of educational experimentation. But the right given to the experimental schools should be reviewed periodically as institutions invested with such powers should continuously earn their privilege. We hope, however, that after the experiment is tried out successfully in a few schools, more and more schools will be released from the restrictive influence of the external examination and given the freedom to work out their own ideas in education.

9.84. **Methods of Internal Assessment.** We shall now pass on to the question of internal assessment to which a reference was made earlier in this section. This internal assessment or evaluation conducted by individual schools is of great significance and should be given increasing importance. It should be comprehensive, evaluating all those aspects of the student's growth that are measured by the external examination and also those personality traits, interests and attitudes which cannot be assessed by it. Internal assessment should be built into the total educational programme of the school and should be used for improvement rather than for certifying the level of achievement of the student. It must be pointed out that all items of internal assessment need not follow qualified scoring procedures. Some of them may be assessed in descriptive terms. The results should be kept separately and not be combined artificially with other results to form aggregate scores.

9.85. The written examinations conducted in schools should be improved on the same lines as the external examination. The use of standardized achievement tests wherever available, is strongly recommended. There is need for developing other types of evaluation tools for improving internal assessment such as interest inventories, aptitude tests and rating scales. They should be prepared by specialists and made available to schools, and the teachers should be trained to use them through a network of in-service programmes. Teachers should also be trained to make simple tests of their own on the models supplied and use them for the assessment of the performance of their pupils.

9.86. We are aware that the experience of introducing internal assessment has not been very happy so far and that there has been persistent over-assessment by the weaker schools. This has led some critics to suggest that the system should be abandoned altogether. We cannot agree with this view. Internal assessment has to continue and its importance will have to be increasingly emphasized To overcome the shortcomings discovered, we make the following recommendations:

(1) The results of the internal assessment and external examination should not be combined because the purposes and techniques of the two evaluations are different and because the results of the internal assessment of the different institutions are not strictly comparable. The results

of the external and internal assessment should, therefore, be shown separately in the certificate(s) given at the end of the course.

(2) It should be an important point in the inspections of schools to review the internal assessment made and to examine the correlation between the internal and external assessments. Persistence in over assessment should be regarded as a weakness in the school programmes. It should be taken due note of while classifying the schools and should also be related to grants-in-aid so that institutions which tend to over-assess their students persistently would stand to lose in status and finance. The grant-in-aid rules should also authorise the Education Department to withdraw recognition for persistent irresponsible assessment

9.87. **Higher Secondary Examination during Transition.** We have recommended above that the first external examination should be held at the end of Class X or the first stage of school education, and the second examination should come after Class XII which will be the end of the higher secondary stage. At present, the higher secondary stage in all the States except Uttar Pradesh and Kerala ends with Class XI after which there is the higher secondary school examination. This will continue to be the position till the duration of the course is extended to two years. During the transitional period, therefore, most students in the higher secondary school will have to appear for two successive external examinations, at the end of Class X and Class XI, within the period of a year. This is undesirable but cannot be avoided, particularly where the course of Class IX, X and XI is not integrated. When the P.U.C. class gets transferred from the affiliated colleges to the high schools, the course will be a non-integrated one.

9.88. As a number of existing higher secondary schools with integrated courses are already in existence in some of the States, we do not insist that this integration should be broken up and the students of the schools should be made to appear for two public examinations within a year. There may be only one public examination for such students—the higher secondary school examination at the end of Class XI. However, we would like to invite attention in this connection to the procedure that is followed in some areas, where the higher secondary school examination is staggered over a period of two years, the core subjects being offered for examination at the end of Class X and the electives at the end of Class XI. This procedure may be adopted with suitable modifications in other places. It must be remembered that the problem is a temporary one and will disappear when schools are organized on the 10 plus 2 pattern.

9.89. The comprehensive programme of evaluation that we have described in the preceding paragraphs requires for its implementation a well-organized machinery both at the State and the Central levels The Secondary Boards of School Education that now conduct external examinations at the secondary stage will be converted into State Boards of School Education with enhanced powers and functions. At the Centre, there will be a National Board of School Education that will be responsible for evaluation programmes at the national level. The composition, the powers and the functions of these Boards will be considered in the next chapter.

CHAPTER X

SCHOOL EDUCATION : ADMINISTRATION AND SUPERVISION

I. *The Common School System of Public Education.* (3) **The present position**; (5) The creation of the common school system of public education; (6) Establishment of District School Boards; (7) Government and local authority schools; (9) Private schools; (18) Good quality private schools; (19) The neighbourhood schools; (21) Scholarships; (23) Conclusion.

II. *Organization of a Nation-wide Programme of School Improvement.* (25) Preparation of institutional plans; (27) Intelligent planning and continuity of effort; (28) Elasticity and experimentation; (29) Classification of schools; (31) A programme for action.

III. *Supervision : Reorganization of the State Education Departments : District Level.* (34) Reorganization and strengthening of district **officers; (38) Headmasters; (39) The school** complex: (44) The new supervision; (45) Separation of administration from supervision; (46) Recognition of schools; (47) Types of institutions; (8) Flexibility

IV. *Reorganization of State Education Departments : State Level.* (50) State Institutes of Education.

V. *State and National Boards of Education.*—(54) Educational standards; (57) State and national standards; (59) State Evaluation Organizations; (64) State Boards of School Education.

VI. *The Role of the Centre.* (70) Establishment of National Board of School Education; (73) Composition and duties of the Board; (76) Programmes in the centrally-sponsored sector

VII. *Independent and Unrecognized Schools.* (77) Educational institutions outside the common school system of public education; (79) The independent schools; (80) The unrecognized institutions

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10.01. In this chapter on school education, we deal with problems of supervision and administration, especially from the point of view of improving standards. A sympathetic and imaginative system of supervision and administration can initiate and accelerate educational reform. On the other hand, a rigid bureaucratic approach can stifle all experimentation and creativity and make any educational reconstruction almost impossible.

10.02. **Essential Reforms.** If the administration and supervision of school education is to be improved, a number of far-reaching reforms will have to be carried out. Among these, the following may be mentioned :

- A common school system of public education should be evolved in place of the present system which divides the management of schools between a large number of agencies whose functioning is inadequately coordinated.
- A nation-wide programme of school improvement should be organized with three objectives: (a) to raise all schools at least to a minimum prescribed level; (b) to assist every school to rise to the highest level of which it is capable; and (c) during the next ten years, to raise at least ten per cent of the institutions to an optimum standard.
- The offices of the District Educational Officers should be strengthened and the existing techniques of supervision should be replaced by new methods which emphasize guidance, objective evaluation and provision of extension services.
- The State Institutes of Education should be strengthened.
- State Boards of School Education and State Evaluation Organizations should be established at the State level—accompanied by the creation of a corresponding machinery at the national level—to stimulate a continuous improvement in standards and to assess them periodically.
- The Central Government should develop a large programme in the centrally-sponsored sector to assist in the improvement of standards at the school stage.

We shall discuss these major reforms in the order given above.

THE COMMON SCHOOL SYSTEM OF PUBLIC EDUCATION

10.03. **The Present Position.** At present, schools are managed by three agencies—government, local authorities and voluntary organizations. The latest available statistics regarding these are for the year 1960-61 and are given in Table 10.1.

TABLE 10·1 : SCHOOLS IN INDIA BY TYPE OF MANAGEMENTS
(1960-61)

Type of Schools	Number of Institutions			
	Government managed	Local authority managed	Privately managed	Total
1. Pre-primary Schools	308 (16·2)	247 (12·9)	1,354 (70·9)	1,909 (100·0)
2. Lower Primary Schools	72,380 (21·9)	184,825 (55·9)	73,194 (22·2)	330,399 (100·0)
3. Higher Primary Schools	9,695 (19·5)	26,481 (53·4)	13,486 (27·1)	49,662 (100·0)
4. Secondary Schools	3,239 (18·8)	2,066 (12·0)	11,952 (69·2)	17,257 (100·0)
5. Vocational Schools	1,729 (41·7)	39 (0·9)	2,377 (57·4)	4,145 (100·0)
6. Special Schools	8,766 (13·1)	5,307 (7·9)	53,011 (79·0)	67,084 (100·0)
TOTAL	96,117 (20·5)	218,965 (46·5)	155,374 (33·0)	470,456 (100·0)

Source. Ministry of Education, Form A.
N. B. The figures in parentheses indicate percentages to total.

It will be seen that government institutions form only one-fifth of the total. The institutions conducted by the local authorities are the largest in number—a little less than half of the total—and most of them are primary schools. The institutions run by private enterprise form about one-third of the total, and dominate pre-primary and post-primary education.

10.04. In so far as finances are concerned, the State supports not only its own institutions but also those of local authorities and voluntary organizations to a substantial extent. In fact, it may be said that the bulk of the expenditure on school education comes from State funds and fees, and that only a small and relatively less significant contribution is made by local authorities or private sources.

TABLE 10·2 : EXPENDITURE ON SCHOOLS IN INDIA BY MANAGEMENTS AND BY SOURCES
(1960-61)

Source	Percentage of Total Expenditure met from the Source Concerned on Schools Conducted by			
	Government	Local authority	Private bodies	Total
Government funds	94·3	68·1	48·2	67·5
Local Board funds	0·1	26·0	1·7	9·7
Fees	5·1	4·2	36·7	16·9
Other sources	0·5	1·7	13·4	5·9
TOTAL	100·0	100·0	100·0	100·0

Source. Ministry of Education, Form A.

It will be seen from Table 10.2 that most of the expenditure on government institutions in 1960-61 was met from government funds (94.3 per cent) and fees (5.1 per cent). The local authorities received 68.1 per cent of their expenditure from government funds and their own contribution was only 26.0 per cent. Fees formed a minor source of their revenue (4.2 per cent) because most of their schools were primary. In private institutions, government grants accounted for 48.2 per cent and fees 36.6 per cent of the total expenditure[1]. Voluntary organizations contributed only a little more than one-eighth of the total expenditure of the private institutions.

10.05. **The Creation of the Common School System of Public Education.** The main problem before the country is to evolve a common school system of public education which will cover all parts of the country and all stages of school education and strive to provide equality of access to all children. This system will include all schools conducted by government and local authorities and all recognized and aided private schools. It should be maintained at an adequate level of quality and efficiency so that no parent would ordinarily feel any need to send his child to the institutions outside the system such as independent or unrecognized schools. This is the goal which the country should strive to reach, and a number of steps will have to be taken for its early realization.

(1) The first is to ensure that the undesirable discrimination that now exists between teachers working under different managements—government, local authority and private organizations—should be done away with. This has been discussed more fully elsewhere[2]; and we have recommended that

—all teachers should have equality of privileges irrespective of the different managements under whom they serve;

—teachers with similar qualifications and responsibilities should have a similar system of remuneration;

—there should be a uniform system of retirement benefits for all teachers;

—the conditions of work and service under the different types of managements should be similar; and

—the methods of recruitment of teachers in institutions of different categories should also be essentially similar.

(2) The ultimate goal should be to provide tuition-free education at the school stage. From this point of view, tuition fees will have to be abolished in a phased programme—fees at the primary stage being abolished by the end of the fourth plan and those at the lower secondary stage by the end of the fifth plan. This has been discussed more fully elsewhere.[3]

(3) The roles of local bodies and private organizations in school education should be properly integrated with those of the State Governments to ensure that the minimum conditions necessary for the successful working of educational institutions are provided in *every* institution within the common system of public education, irrespective of its management. For instance, every such institution should be intimately involved with its local community. Each should be regarded as an individuality and given adequate freedom. A continuous attempt should be made to develop each school to the best extent possible in accordance with a plan to be prepared and implemented jointly by the management, parents, teachers and students, and the Department: and every institution should be assured of adequate financial support to discharge its responsibilities to its student body.

(4) The neighbourhood school plan should be adopted as a step towards eliminating the segregation that now takes place between the schools for the poor and the underprivileged classes and those for the rich and the privileged ones.

It is these last two aspects that we shall now discuss in some detail.

10.06. **Establishment of District School Boards.** We attach great significance to the association of the local community with the development of education. We have, therefore, recommended elsewhere[4] that a statutory local authority, to be called the District School Board, should be established in each district and that it should be in charge of all education below the university level in the district. This Board will have, under its direct control, all schools now conducted by government as well as by local authorities. In addition, it will also give grant-in-aid to private and aided schools within the district, on the recommendation of the

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[1] A large proportion of the fee receipts in private institutions is indirectly paid by the State itself through reimbursement in lieu of fee concessions and scholarships.

[2] Chapter III.

[3] Chapter VI.

[4] Chapter XVIII.

District Education Officer in whom is vested the authority to supervise and inspect schools. The School Board will be responsible for the planning and development of all school education in accordance with the directive given by the State Government from time to time. We have shown earlier[1] that there are immense differences in educational development between one district and another. We believe that the creation of such a statutory authority for each district would greatly assist in reducing these differences. Each State Government should prepare plans for creating this machinery in accordance with its own local conditions and traditions.

10.07. **Government and Local Authority Schools.** Some problems of schools under the management of government and local authorities deserve notice. Government institutions, for instance, have certain advantages such as good financial support, good system of remuneration and retirement benefits and security of tenure for their teachers, and a fairly adequate provision of other physical facilities. In spite of all these assets, however, most government schools show an average performance; and though some of them rise above the average, very few qualify for the top places in the school system. This is so because of several reasons. The average government school is isolated from its community, and sometimes even indifferent to it. The over-security of service creates an atmosphere of complacency and lethargy, especially because the conduct and discipline rules are such that it is difficult to reward merit, and even more so, to punish slackness. The teachers are recruited, not to individual institutions, but to a cadre and are frequently transferred from one institution to another. Consequently, they do not ordinarily develop loyalty to any individual institution. They also have the minimum academic freedom and are hampered by rules and regulations at every step. The local authority schools also suffer from all these disadvantages. They have one compensating asset, namely, that they are more closely involved with their community. In practice, however, this generally proves to be, not an asset, but a disadvantage, because their teachers are often harassed through postings and transfers and become involved in local politics and factions. A programme is, therefore, needed to overcome these weaknesses of government and local authority schools, so that the country can get an adequate return for the comparatively large investment it makes in these schools.

10.08. For this purpose we make the following recommendations:

(1) There should be a *School Committee* to look after every government or local authority school (or all the government and local authority schools in given area, such as a village panchayat or a town municipality). Such a committee will bring these schools closer to their local communities. Half the members of these committees should be elected by the local authority in charge of the area—village panchayat or municipality—and the remaining should be persons interested in education, nominated by the District School Boards. The functions of these committees will include, among other things, the following:

(a) Responsibility for securing proper accommodation and construction and maintenance of school buildings, school gardens, children's parks and playgrounds;

(b) Provision of equipment;

(c) Distribution of books and writing materials to children;

(d) Grant of uniforms, scholarships and prizes;

(e) Enforcement of compulsory education within the area;

(f) Assisting in the organization of extra-curricular activities and in building up close relationship between the schools and the community;

(g) Provision of mid-day meals;

(h) Securing residential accommodation for teachers; and

(i) Generally taking all such measures as will help in improving school education within the area.

Each school committee should have a fund of its own for the proper discharge of its responsibilities. This fund, which may be designated as the *School Fund*, will consist of (a) amounts placed at its disposal by the municipality or the village panchayat in the area; (b) donations and contributions voluntarily made by the parents and local community from time to time; and (c) a grant-in-aid given by the District School Board to stimulate local collections under (a) and (b) on some basis of equalization, *i.e.* a larger grant-in-aid being given to the poor areas while the richer ones may get a smaller one or none.

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[1] Chapter VI.

The entire proceeds of the fund should be locally available for the development of such services in the schools as would supplement the effort made by the District School Board.

It is evident that all School Committees will not be equally efficient. The system to be designed should, therefore, be elastic. School Committees that are functioning well should be given more powers and more funds. The powers of those which are not working efficiently may be curtailed.

If properly developed, this programme would make the local communities vie with one another in improving their schools, and their efforts should be a good supplement to those of the District School Board itself.

(2) Rational and appropriate policies have to be developed for transfers and postings of teachers which now cause considerable harassment, particularly to primary teachers under local bodies. As a rule, teachers should be allowed to remain in the same schools as long as possible and to develop loyalties to individual institutions.

(3) It is also necessary to give greater freedom to government and local authority schools and to reduce the existing red-tape to the minimum. Private schools already have a good deal of freedom, which is their main asset. There is no reason why similar freedom should not be given to government schools, where teachers and facilities are ordinarily of a better quality and where the freedom is likely to be better utilized.

10.09. **Private Schools.** The private educational institutions form a very heterogeneous group, falling into three main categories: recognized and aided institutions, recognized but unaided or independent institutions, and unrecognized institutions. The magnitude of the last two of these categories is small and we shall deal with them separately later. But the recognized and aided institutions, in spite of their 'private' management, have to be treated as an integral part of the system of public eduction. Most of their expenditure comes from government grants and fees; and where fees have been abolished, they depend almost exclusively on government funds. Their main assets are: strong ties with the local community on whom they depend for support; a fair measure of freedom, although this is disappearing rapidly under increasing departmental controls; and the loyalty of teachers who are recruited unlike in government or local authority service, to individual institutions. Their main weaknesses are two: a precarious financial position, due partly to the uncertainty of government grants and partly to their own increasing incapacity to raise funds; and very often, a bad and even unscrupulous management.

10.10. From the point of view of quality and efficiency, these institutions fall into two broad groups; a small group of very efficient institutions and a large group of weak and even undesirable ones. The institutions in the former have attracted—and continue to attract—competent and dedicated teachers who often form a self-perpetuating body of their own, and who remain virtually in charge of the management. Consequently, they maintain very good standards. The latter group includes a number of voluntary organizations which are dominated by sectarian considerations that affect the recruitment of teachers as well as their atmosphere. Several of them are run, not for purposes of education or social service, but for exploitation and patronage and are like commercial undertakings. The conditions of service of teachers working under several of these organizations are far from satisfactory. They have little security of tenure and no pensionary benefits and sometimes not even a contributory provident fund; their remuneration is generally lower than that given to teachers of corresponding status under government or local bodies. In many cases, they do not even receive the amount which is supposed to have been paid to them because the managements, who are unable to raise popular contributions, often try to produce the matching contributions required of them under the grant-in-aid rules by an illegal and unacknowledged cut in teachers' salaries. It must be admitted that, by and large, these schools make a rather negative contribution to education and life, and they pose a major problem in school education.

10.11. In spite of all these limitations and deficiencies, however, these institutions will have to be treated as an integral part of the common school system of public education. It is the responsibility of government to see that they are improved through adequate support and proper management. This responsibility becomes all the greater because the bulk of the students in secondary schools are in these institutions. Unfortunately, the efforts of the education departments in dealing with this problem have not been very successful. As the existing grant-in-aid rules are based on egalitarian principles, all private schools are treated alike for purposes of financial assistance. This very often cramps the progress of the good schools while funds are unduly wasted on the poor ones. The attempt to check malpractices which are often found in the second group of these institutions and to give security of tenure to their teachers has resulted in a large measure of detailed control which again is applied to all schools alike. This has not achieved its primary purpose, but has, on the contrary, weakened the discipline in these institutions and made things unnecessarily difficult even for good institutions who need, not greater control, but greater freedom. Moreover, the grant-in-aid rules are generally complicated and difficult to administer and the amount of aid is inadequate. Consequently, most of these institutions have remained in a very unsatisfactory condition.

10.12. What is really needed is a discriminating rather than a uniform policy in respect of assistance to and control of private aided institutions. The good private schools which maintain high standards and which have been able to attract the services of dedicated and competent teachers will have to be identified and given more freedom and adequate financial assistance. These institutions even today are the quality schools in the system and set the pace for others. They can quickly and effectively be developed as the 'seed farms' in the common school system of public education. At the same time, a sympathetic but firm policy will have to be adopted with the large group of private institutions which are sub-standard. They should be given time and assistance to put their houses in order. We expect that many of them will rise to the occasion and become good schools; but there will be many more that may not do so. These latter should be dealt with firmly and either closed down or taken over by the government.

10.13. The position of private schools will be greatly affected by our recommendation that tuition fees should be abolished till the end of Class X. When this recommendation is implemented, all fee-charging and aided private schools should be given the option either to abolish the fees and remain within the system or continue to charge fees and become independent. We anticipate, however, that most of the private schools will choose to remain within the common school system of public education. Ultimately, therefore, there will be only two types of private schools: (1) those which do not charge fees and remain within the common school system of public education and are mostly supported by the State; and (2) those which charge fees and remain outside the system and receive no aid from State funds.

10.14. With regard to those which remain within the common school system of public education, the action required will be very different from that suggested earlier for government and local authority schools. For the latter, we have recommended a closer association with the local community, grant of greater freedom, and a restraint on transfers so that teachers will remain stabilised in individual institutions for long periods. The private schools have these advantages already. What they need is greater financial assistance and, in several cases, a better management. For this we recommend the following:

(1) Each private school should have a *Managing Committee* consisting of the representatives of the voluntary organization conducting it, the Education Department and its teachers. The grant-in-aid codes will have to prescribe the details of the composition of these committees and their powers and responsibilities. It has to be noted that the primary objective of government nominations is to assist the management by securing for them the advice and guidance of persons interested in education. The success of the system will depend upon the quality of the persons nominated. If this authority is judiciously exercised, as it should, be, the managements will welcome the government nominees as a source of strength.

(2) The staffing of the private schools should be broadly on the pattern prescribed for government or local authority schools and their remuneration should also be similar.

(3) For calculating the recurring grant-in-aid to private schools, the total expenditure should be divided into two parts—teacher costs and non-teacher costs. It will be easy to determine the total teacher costs

because of the recommendation made in (2) above. For all non-teacher costs, a minimum and a maximum expenditure should be prescribed, preferably as a percentage of the teacher costs, and the management should be given the freedom to incur this expenditure at its discretion. The grant-in-aid to a school should be equal to

(a) the total teacher costs;

(b) *plus* the actual non-teacher costs[1] incurred (or the upper limit prescribed, whichever is less);

(c) *minus* income from fees at 'standard' rates, after allowing for the prescribed percentage of free studentships (it being open to the management to give additional free studentships from their own resources); and

(d) *minus* the prescribed contribution to the total recurring expenditure which the management will be required to make from its own funds and not from fees.

Note: (i) The lower and the upper limits to non-teacher costs as well as the contribution to be made by the management should be prescribed separately for each type of school and also separately for advanced or poorer areas. Some concessions should also be shown to girls' schools.

With regard to the contribution from private managements, we expect a secondary school to provide an endowment of Rs. 50,000 and a higher secondary school, an endowment of Rs. 100,000. Until that is formed, the contribution of the management should be equal to the interest on an endowment of this order.

(ii) Where fees are charged, it is only the standard fees prescribed by government (and not the actual fees) that should be taken into account for purposes of grant-in-aid. It should be open to the management to charge fees at lower rates and meet the loss thus incurred from its own resources. Similarly, it will be also open to the management to charge fees at higher rates, not exceeding fifty per cent of the standard fees, with the approval of the Department, and to utilise the proceeds for providing additional services in the school or for raising its standard of instruction.

(iii) When fees are abolished, item (c) will disappear. We, however, recommend that in such cases, it should be open to private *secondary* schools (this authority should be given also to government and local authority secondary schools) to charge a 'betterment fund' from their students subject to an upper limit, say five rupees a year, with the approval of the Department. The income from this fund should be utilised for improvement of instruction or provision of additional facilities. Its accounts will be kept separately and be open to inspection by the Department, but these should not be taken into consideration while fixing the grant-in-aid to the school.

(4) With regard to non-recurring costs, we think that the managements of private schools should bear a fair share of the total expenditure. By and large, the grant-in-aid should, therefore, be limited to 30 to 50 per cent of the total non-recurring expenditure. In special cases, such as poorer localities or girls' schools, the proportion of grant-in-aid may be increased. It should also vary from one type of institution to another.

(5) The formula suggested above is meant for grant-in-aid to the average school. In implementing it, two provisos will have to be added:

(a) There should be a system under which cuts could be made in the grant-in-aid due to a school for patent failure to maintain standards *e.g.*, inability to retain staff for sufficiently long periods, complaints from staff regarding treatment, poor discipline among students, low results in public examinations.

(b) Schools which maintain high standards and show good results should be given special encouragement grants for any projects which they may like to undertake with the approval of the Department.

(6) In the preceding chapter, we have recommended that some schools should be regarded as experimental schools and given the freedom from external public examinations and all that they imply. When such schools are in the public sector, the State Government or the local authority, as the case may be, will have to make adequate provision of funds for their maintenance and development on a basis different from that of the average school. When such

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[1] As in the case of affiliated private colleges, the rent on buildings constructed by the management from its own funds should be allowed for purposes of grant-in-aid. See Chapter XIII.

schools are in the private sector, grants-in-aid to them will also have to be given on a special basis *e.g.*, a liberal block grant renewable every three or five years. These schools will not develop adequately under the normal grant-in-aid code.

10.15. We have recommended above that a discriminating approach should be adopted with regard to private schools and that greater freedom and assistance should be made available to good schools while a larger control should be exercised over the weaker ones. We may illustrate how this might be done in the system we have proposed. In the first place, government may vary the number of members nominated by it on the managing committees from institution to institution. In the case of very good institutions which have maintained standards over a considerable time, this representation may be reduced to the minimum. On the other hand, in the case of weaker schools where complaints have been received and are frequent, the proportion of members nominated by the Department should be increased till it forms the majority. A management which makes a larger contribution from its funds may be given a greater representation to induce a larger flow of private funds. Secondly, the limits prescribed for the non-teacher costs could be higher for good schools which have shown good performance and merit. Thirdly, better staffing may be permitted to schools that show good results—in the sense of a more favourable pupil-teacher ratio or a larger proportion of posts in the higher categories.

10.16. In many grant-in-aid codes it has been laid down as a condition of recognition or aid, that educational institutions should be conducted only by non-profit-making bodies such as public trusts or societies, registered under the Charitable Societies Act. In some areas, however, proprietory schools are still recognized and aided. We recommend that it should be an invariable rule that educational institutions must be conducted by non-profit-making bodies if they have to qualify themselves for assistance.

10.17. The existing grant-in-aid codes confer on the State Education Departments the right to withdraw recognition under certain conditions. In practice, however, this theoretical right is hardly ever exercised. There are two main reasons for this: sympathy for the teachers who will be thrown out of job, and concern for the students whose studies will be disturbed. We, therefore, recommend that the grant-in-aid codes should be amended to authorise the State Education Departments to take over the management of private schools which do not satisfy requirements and which have persistently failed to come up to standard. Before this extreme action is taken, the Department should frame charges against the management and give due notice. If necessary, an appeal may be made to a tribunal specially set up for the purpose. But the Department should have the authority, in extreme cases, to take over private schools. Such a provision will have a very salutary effect and help in raising standards in the weaker group of private schools.

10.18. **Good Quality Private Schools.** There is one important point that needs attention. Many of the good private schools are fee-charging institutions at present. When fees are abolished, some of these schools will become independent. But the vast majority will try to remain within the system and they should be encouraged to do so by being promised adequate grant-in-aid and autonomy. In Madras, when fees were abolished at the secondary stage, the existing level of expenditure of each private school that remained within the system and the salaries of the existing staff were protected. This has yielded excellent results. There is, however, one flaw in the Madras arrangement, *viz.*, the future pattern of expenditure—as existing teachers retire—is brought down to the common level. We propose an important alteration: such of these schools as are really good should be regarded as the nuclei of the quality schools to be developed (this recommendation of ours is discussed in a later section), and should be adjusted to the higher level prescribed for the quality schools rather than to that of the ordinary schools. This will ensure that the existing standards of the institutions will not be adversely affected and, in some cases at any rate, they may even be improved further. Incidentally, this will also discourage the trend to step out of the system as independent institutions.

10.19. **The Neighbourhood Schools.** We drew attention earlier[1] to the social segregation that now takes place in our primary and secondary schools and pointed out that such segregation should be eliminated if education is to be made a powerful instrument of national development in general, and social and national integration in particular. From this point of view, we recommend the ultimate adoption of the 'neighbourhood school concept' first at the lower primary stage and then at the higher primary. The neighbourhood school concept implies that each school should be attended by *all* children in the neighbourhood irrespective of caste, creed, community, religion, economic condition or social status, so that there would be no segregation in schools. Apart from social and national integration, two other important arguments can be advanced in support of the proposal. In the first place, a neighbourhood school will provide 'good' education to children because sharing life with the common people is, in our opinion, an essential ingredient of good education. Secondly, the establishment of such schools will compel the rich, privileged and powerful classes to take an interest in the system of public education and thereby bring about its early improvement.

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[1] Chapter I.

10.20. We are of the view that the neighbourhood school concept should be adopted as a long-term goal, to be reached in a well-planned programme spread over the next 20 years. The strategy for its adoption should be as follows:

(1) During the next ten years, two programmes should be pursued side by side. The first is to improve all primary schools to a minimum level prescribed and to raise about ten per cent of them to a higher standard of quality.

(2) Simultaneously, the neighbourhood school system should be introduced at the lower primary stage, as a pilot project, in a few areas where public opinion is favourable to the acceptance of the proposal.

10.21. **Scholarships.** On grounds of social and national integration, we believe that all the children of the country should study in the common school system of public education, because this experience is extremely significant for their development as citizens. To encourage this trend in the national interest, we recommend that the public scholarships at the school stage, *i.e.*, those given by government and local authorities, should be tenable only in a school functioning within the common school system of public education, which will ultimately charge no fees and to which every child shall have access. This will not cause any hardship, because it is mostly the children of the rich persons who will be attending the independent schools and they will not be in need of any such scholarships.

10.22. At the university stage also, it is essential to see that children coming up from the common school system of public education are not at a disadvantage in comparison with those appearing from the independent schools. We, therefore, suggest that ninety per cent of the scholarships awarded from public funds at the university stage should be open only to those students who have received their secondary education in schools functioning within the common school system of public education.

10.23. **Conclusion.** If the proposals made above are implemented, we will have created a common school system of public education embracing three categories of educational institutions—government, local authority and private-aided—which form the vast bulk of all the educational institutions at this stage. The residual responsibility for the financial support of this system will be borne entirely by the State, although the local authorities and private management will be raising some resources of their own to supplement State effort. Within this organization, the existing 'caste' system on the basis of management will largely disappear and a number of common features will be maintained for all schools, such as parity with regard to teachers; common admission policies which will prevent segregation of classes and ensure admissions to all quality institutions on the basis of merit; involvement with local communities; and freedom for experimentation and creativity.

ORGANIZATION OF A NATION-WIDE PROGRAMME OF SCHOOL IMPROVEMENT

10.24. In view of the great need to improve standards of education at the school stage, we recommend that a nation-wide programme of school improvement should be developed in which conditions will be created for each school to strive continually to achieve the best results of which it is capable. No comprehensive programme of educational development can ever be put across unless it involves *every* educational institution and *all* the human factors connected with it—its teachers, students and the local community—and unless it provides the necessary inducements to make them put in their best efforts. For various reasons, this involvement does not take place and the motivation is not created at present. The main objective of this programme is to create these factors which have a large share in determining standards.

10.25. **Preparation of Institutional Plans.** The first step in the undertaking would be to request each school to prepare its own developmental programme spread over a given time. One of the major weaknesses of our system of planning is that it begins at the top and hardly ever descends down to the institutional level. Consequently, most of our schools remain unconcerned with the educational development plans prepared at the State or national levels. Very often, they are not even aware of these plans and of their policies and programmes. It is imperative to change this situation. It is, of course, true that, in order to avoid a waste of effort, some broad framework for the preparation of these plans would have to be supplied by the appropriate authorities at the State, district or block level. It should not be difficult to enable each school, within the resources likely to be available, to prepare a plan of optimal utilization and growth.

10.26. Each such plan will necessarily include proposals for the improvement of the physical facilities available in the institution. We realize the need to provide certain minimum essential facilities without which it is almost impossible for teachers to work. However, we would like to emphasize two points in this regard:

(1) The first is that even within its existing resources, however limited they may be, every educational institution can do a great deal more, through better planning and harder work, to improve the quality of education it provides. In our opinion, therefore, the emphasis in this movement should be, not so much on physical resources, as on motivating the human agencies concerned to make their best efforts in a co-ordinated manner for the improvement of education, and thereby offset the shortcomings in the physical resources. There are a large number of programmes which an educational institution can undertake on the basis of human effort and in spite of paucity of physical resources. These include: reduction in stagnation and wastage; improvement of teaching methods, assistance to retarded students; special attention to gifted students, enrichment of the curricula; trying out new techniques of work; improved methods of organizing the instructional programme of the school; and increasing the professional competence of teachers through programmes of self-study. It is the planning and implementation of programmes of this type that should be emphasized.

(2) The second is that an intensive effort should be made to improve the facilities provided in schools through the co-operation of the local community. Very good work in this respect has been done in the Madras State where school improvement conferences have been organized for some years and large-scale assistance from the local community has been obtained for improving school facilities. Similar programmes should be developed in all parts of the country, both at the primary and secondary stages[1].

10.27. **Intelligent Planning and Continuity of Effort.** The secret of success in such a programme will depend upon intelligent planning and continuity of effort. It is essential to give an orientation to all officers of the Education Departments and all headmasters of schools in the preparation of such plans. Success will also depend on the programme being a nation-wide movement—or at least a State-wide movement—taken up earnestly by the Ministry of Education at the Centre and by the Education Departments in the States. Intensive campaigns of this type were sometimes launched in the past in some parts of the country under the guidance of enthusiastic officers. But their effort was both localized and short-lived and they generally faded out with the motivating personality. It is, therefore, necessary to make this campaign an integral part of our educational plans so that its tempo could be continuously maintained at a high level for a sufficiently long time.

10.28. **Elasticity and Experimentation.** Another pre-condition for the success of a programme of this type is to encourage initiative, creativity and experimentation on the part of teachers and institutions. One of the weaknesses of our existing educational system is its rigidity which practically denies freedom for experimentation to teachers and institutions. What is needed is a decentralized approach which can permit each institution (or at least a group of institutions) to go ahead at its own pace and try out new ideas. This is not possible in the existing system where educational plans are prepared with the State as a unit and where all that is expected on the part of teachers and institutions is conformity. In the proposal made above, Government has to regard each institution as a unit in itself, having an individuality of its own, and to help it to grow at its own pace and in its own individual manner. This will make it possible for teachers to participate in the joy of creation and will motivate them to more intensive efforts at qualitative improvement[1].

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[1] See paper on the subject included in Supplementary Volume 1, Part V.

10.29. **Classification of Schools.** Some administrative and financial issues will have to be taken care of adequately if this programme is to succeed. Reference has already been made to three of them : the need to secure continuity of staff which will make long-term planning and its implementation feasible; the need to involve each institution closely with its local community and give it some local resources and freedom to plan its own programmes; and the need to break the isolation of schools and enable them to function in small, face-to-face, co-operative groups[2]. Yet another step that will help in this process is the classification of schools.

10.30. For this purpose, we make the following recommendations :

(1) It would be necessary to prepare scientific evaluative criteria for supervision of different types of educational institutions. The National Council of Educational Research and Training has already undertaken a research project for this purpose. The work thus initiated will have to be developed further by each State, through the State Institute of Education.

(2) The criteria should be defined at two levels—minimum and optimum. The optimum level should conform to the concept of a 'good' school. To begin with, each State will define, with respect to its own conditions, what these minimum and optimum levels should be. But in due course, these criteria could be co-ordinated and national norms evolved by the National Board of School Education whose establishment we are recommending. It is also necessary to revise these criteria from time to time and to upgrade them.

(3) On the basis of such evaluative criteria, a scheme for the classification of schools should be devised on the basis of their performance. The factors to be considered for such classification may, among others, include: relations with the local community; the qualifications of the staff and the continuity of the staff in the same institution; in-service training programmes arranged by the school or participated in by members of the staff; special programmes developed in the school such as experimental work, advanced or enriched curriculum, or new methods of evaluation; attention paid to the gifted or retarded students; school discipline; wastage and stagnation; results of public examinations; scholarships secured by students; after-school careers of past students; and organization of co-curricular activities and awards won by the school in these fields.

(4) The classification should be made applicable to all schools—government, local authority and private. Norms may be defined at two levels—optimum and minimum, and a three-point scale may be adopted on that basis :

A—Schools: above the optimum level.

B—Schools: average schools between the minimum and the optimum levels.

C—Schools: below the minimum level.

(5) The general convention should be that each school evaluates its own work on the basis of the given criteria and the classification is then finalised by the inspecting officers of the Department in consultation with the school teachers and authorities.

10.31. **Programme for Action.** It will not be possible, for lack of resources, to raise all schools to a high level within a short period. The strategy to be adopted for development should, therefore, be on the following lines:

(1) The highest priority in the programme should be given to the

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[1] See Chapter IX for details.

[2] See Chapter II.

creation of a minimum proportion of 'quality' schools at every stage which would serve as pace-setting institutions. The number of really good schools in the present system is pitifully small, and in order to obtain good results in the shortest time, it is necessary to concentrate available resources in a few centres. As a first step towards improving all schools, therefore, we should strive to improve, during the next ten years, at least ten per cent of the schools at the primary stage to an optimum level. At the secondary stage, the target should be to have a good secondary school (*i.e.*, at the optimum level) in every community development block[1].

(2) This programme of creating optimum level schools will begin with the strengthening of the existing good schools. At the secondary stage most of these are in the private sector. While these should be assisted to develop, an attempt should be made in future to have good secondary schools in the public sector as well.

(3) At the lower primary stage, the access to these schools will mostly be for children in the neighbourhood only. That is why it is essential to distribute these schools equitably in all parts of the State and to pay special attention to the needs of the rural areas and the urban slums.

(4) At the higher primary and secondary stages, admissions to these schools—with the abolition of fees they will be really open to all children—should be regulated on the basis of merit to ensure that the brighter children from all strata of society receive the best education available. There should be adequate provision of scholarships in these schools. They should also be equitably distributed on a geographical basis, one secondary school being set up in each community development block and two or three higher primary schools in different parts of the same block.

(5) The second priority in the programme is to ensure that no school falls below the minimum levels.

(6) With regard to other schools, each should be assisted to rise to the best level of which it is capable. The system of assistance should be such as to reward good performance as indicated by periodical evaluations. As time passes, more and more of these schools will rise higher and pass into the class of 'quality' schools.

10.32. The basic approach so far in the programmes of qualitative improvement has been to stress the provision of physical facilities rather than the operation of the human factor. It will be seen that the object of the nation-wide programme of qualitative improvement proposed here is to reverse this process and to stress the contribution which the combined efforts of teachers, supervisors, parents and students themselves can make to the qualitative improvement of education. We believe that, if such a programme of the type indicated above is organized and sustained over the next 10-20 years, standards in education will rise immensely.

SUPERVISION: REORGANIZATION OF THE STATE EDUCATION DEPARTMENTS: DISTRICT LEVEL

10.33. In our view which has been more fully discussed elsewhere[2], school education is essentially a local-State partnership. We have already referred to the responsibilities of the local authorities—the District School Boards and local school committees. The picture, however, will not be complete unless we supplement it with a description of the role of the State Government in school education. As we visualize it, the responsibility for school education will rest squarely on the State Governments. The local authorities will, no doubt, have a good deal of initiative and we should like the State Governments to encourage them by adopting flexible policies. But, by and large, they will act as agents of the State Governments and exercise delegated powers. The State Education Departments, which are the principal agency of the State Government to deal with educational matters, therefore, should

—develop an intensive programme for school improvement which would include periodical revision and upgrading of curricula, preparation of textbooks, teachers' guides and other teaching and learning materials, and improvement in methods of teaching and evaluation;

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[1] The urban areas have more than their share of good schools already, but the needs of slum areas in cities may have to be specially looked after,

[2] Chapter XVIII.

- prescribe the standards to be maintained in schools, in consultation with professional bodies like the State Board of School Education, and State Evaluation Organization and enforce them through the inspectorate, provision of funds, and organization of the needed supporting services;
- be responsible for the supply of teachers, for fixing their remuneration, retirement benefits and conditions of work and service, and for organizing teacher preparation—both pre-service and in-service—on proper lines and for establishing, conducting or aiding training institutions of high quality with adequate intakes and outputs;
- be solely responsible for inspection and supervision of schools which may be exercised directly through the officers of the State Education Departments or indirectly through a special organization set up for the purpose, *e.g.*, the State Boards of School Education, or both;
- establish and maintain a State Evaluation Organization whose objective would be to co-ordinate standards as between the different districts in the State and to help in the development of national standards at the end of the higher primary, lower secondary and higher secondary stages;
- encourage, guide and assist the local authorities created for the administration of school education and help them maintain quality institutions at different stages of school education and provide a regular programme of extension services to schools in order to secure a continual improvement of standards;
- establish and maintain a State Institute of Education whose primary objective is to help, through suitable programmes of research, training and extension, the local authorities and the inspecting officers to improve standards; and
- co-ordinate and eventually assume responsibility for all vocational and technical education at the school stage.

10.34. **Reorganization and Strengthening of District Offices.** If these functions are to be properly implemented, one major change is needed in the organization of the State Education Departments. In the last few years the Directorates of Education at the State level have expanded very considerably in response to the expansion of educational facilities at the school stage. Unfortunately, there has been no adequate delegation of authority to the lower levels, and the district offices in particular continue to be weak. In fact, no feature of the State educational administration is so conspicuous as the wide gap between the heavy responsibilities which are placed upon the district-level officer of the department on the one hand and the inadequacy of his staff (both in number and quality) and of his authority on the other. It is this gap that has to be bridged.

10.35. It is hardly necessary to emphasize the importance of the District Education Officer and his establishment at the district level. He is charged with leadership functions in relation to the district as the Director is in relation to the State. He supervises the educational institutions at the school level and is assisted by one or more deputy inspectors and a number of assistant or sub-deputy inspectors who are responsible for the inspection of primary schools. In some districts, he belongs to Class I of the State Service, but in a large number of other districts, he is still in Class II. In our opinion, neither status is adequate for the purpose. The nature of the administrative duties he has to perform differs from State to State. In some States, he is the sanctioning authority for grants-in-aid to secondary schools. In almost all States, he is the reporting authority for recognition of schools, a member of the appellate body which hears appeals of teachers, and generally also a member of the Selection Board to select teachers for local authority schools. His main function is, however, inspection and supervision, which lies at the heart of educational administration.

10.36. As time passes, the district will assume still greater importance. Today, a district has an average population of about 1·5 million, an enrolment of about 200,000, about 7,000 teachers and a total educational expenditure of about Rs. 20 million. By

1986, the population of the average district will be about 2.5 million. Its enrolment may rise to about 500,000 with a total cadre of about 20,000 teachers and a total educational expenditure of about Rs. 125 million. All things considered, the future of development and reform lies in strengthening the district offices of the Department, making them service and supervision centres of all schools, and retaining the State-level Directorates only for general co-ordination and policy-making. This is the only way in which the weaknesses of the present departmental administration—rigidity, distance from schools, lack of contact with the local communities, emphasis on control rather than on service, etc.—can be remedied.

10.37. In view of the importance of strengthening the departmental organization at the district level, we make the following recommendations:

(1) The District Education Officer should be given adequate status. This can most conveniently be done by including this post in the proposed Indian Educational Service when it is created.

(2) There should be adequate delegation of authority to the district level so that the district office can function with effectiveness and efficiency. In our opinion, the district office should virtually be the Directorate in so far as the schools are concerned, and the need for schools to go to the higher levels in administrative matters should be reduced to the minimum.

(3) With regard to the inspectorial staff at the district level, there are three main weaknesses at present: inadequacy of numbers; comparatively poor quality of personnel because of the inadequate scales of pay; and lack of specialization because most inspecting officers are 'generalists'. All these limitations will have to be overcome. We, therefore, recommend an upgrading of the scales of pay and recruitment of a higher quality of officers. We also recommend that there should be an adequate specialized staff at the district level, *e.g.*, in evaluation, curriculum improvement and guidance or special areas like physical education. It is also necessary to increase the strength of the district staff to cope with all the new responsibilities delegated to it. In particular, there is need to provide a small statistical cell in each district office. It is the absence of this staff that is mainly responsible for the inordinate delays that now occur in the collection and publication of educational data. Similarly, a fair proportion of the staff at this level should consist of women officers, especially with a view to encouraging the education of girls.

10.38. **Headmasters.** This chain of delegation of authority cannot end with the district office. It is also essential to give wider powers to headmasters and greater freedom to schools. At present, the headmasters as a class have been neglected. It will be seen that, in our proposals, better scales of pay have been provided for headmasters and also better qualifications.[1] We further recommend that special training courses (which do not exist at present) should be organized for headmasters. They should include short induction courses for those who are newly promoted as headmasters as well as periodical refresher courses for others. Besides this, there should be greater delegation of authority to headmasters than is found at present. The government schools often suffer the most in this regard. For instance, the headmasters are not always consulted with regard to the transfers of staff from or to their schools; they are not generally involved in the selection of their assistants; they have no authority to fill short-term vacancies in their institutions with the result that these posts remain unfilled for days together; and in several cases, even the necessary authority to control assistants is not given, and if an assistant does not behave, the headmaster can do little beyond 'reporting' to the appropriate authorities. If schools are to improve, this situation has to be radically changed. The general principle should be to select the headmasters carefully, to train them properly, to trust them fully and to vest them with necessary authority. They might commit mistakes—as all human beings do. But unless the freedom to commit mistakes is given, no headmaster will be able to take deep interest in the school and in its improvement. In private schools, the department should insist that the management should delegate similar and adequate powers to the headmasters to enable them to manage the institutions properly.

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[1] Chapter III.

10.39. **The School Complex.** The idea of the school complex or the manner in which a high school, about three or four higher primary schools and 10 to 20 lower primary schools in the neighbourhood would be integrally linked together, has been described earlier[1]. We shall now proceed to discuss how the school complexes should function as a part of the new supervision we are proposing. As explained earlier, the objectives of introducing the school complex will be two: to break the isolation of schools and help them to function in small, face-to-face, cooperative groups; and to make a delegation of authority from the Department possible. As we visualize the picture, the District Educational Officer will be mainly in touch with each school complex and as far as possible, deal with it as a unit. The complex itself will perform certain delegated tasks which would otherwise have been performed by the inspecting officers of the Department, and deal with the individual schools within it. Under this programme, the schools will gain in strength, will be able to exercise greater freedom and will help in making the system more elastic and dynamic. The Department will also gain—it will be able to concentrate its attention on major essentials and can afford to have fewer officers but at a higher level of competence.

10.40. How will the school complex function? If the system is to be effective, adequate powers and responsibilities will have to be delegated to the complex. These may include the following:

(1) The school complex may be used as a unit for the introduction of better methods of evaluation and for regulating the promotion of children from class to class or from one level of school to another.

(2) As stated earlier, it is possible to provide certain facilities and equipment, which cannot be provided separately to each school, jointly for all the schools in a complex. This will include a projector with a portable generator which can go round from school to school. Similarly, the central high school may have a good laboratory and students from the primary schools in the complex may be brought to it during the vacation or holidays for practical work or demonstration. The central high school may maintain a circulating library from which books could be sent out to schools in the neighbourhood. The facilities of special teachers could also be shared. For instance, it is not possible to appoint separate teachers for physical education or for art work in primary schools. But such teachers are appointed on the staff of secondary schools; and it should be possible, by a carefully planned arrangement, to make use of their services to guide the teachers in primary schools and also to spend some time with their students.

(3) The in-service education of teachers in general, and the upgrading of the less qualified teachers in particular, should be an important responsibility of the school complex. For this purpose it should maintain a central circulating library for the use of teachers. It should arrange periodical meetings of all the teachers in the complex, say, once a month, where discussions on school problems could be had, some talks or film shows arranged, or some demonstration lessons given. During the vacations, even short special courses can be organized for groups of teachers.

(4) Each school should be ordinarily expected to plan its work in sufficient detail for the ensuing academic year. Such planning could preferably be done by the headmasters of the schools within the complex. They should meet together and decide on broad principles of development in the light of which each individual school can plan its own programme.

(5) It is very difficult to provide leave substitutes for teachers in primary schools, because the size of each school is so small that no leave reserve teacher can be appointed. This becomes particularly difficult in single-teacher schools where, if the teacher is on leave, the school has to remain closed. In the school complex concept, it will be possible to attach one or two leave reserve teachers to the central secondary school; and they can be sent to schools within the complex as and when the need arises.

(6) Selected school complexes can be used for trying out and evaluating new textbooks, teachers' guides and teaching aids.

(7) The school complex may also be authorised to modify, within prescribed limits, and subject to the approval of the District Educational Officer, the usual prescribed curricula and syllabuses.

10.41. It is obvious that this idea of the school complex will have to be preceded by the careful preparation and orientation of teachers. We recommend that the scheme should be first introduced in a few selected districts in each State as a pilot project. When a district is selected for the purpose, the necessary literature regarding the scheme should be prepared in the regional languages and distributed to all the schools and teachers in the district as the first step in the programme. The plan should then be discussed in all its details in group meetings of all teachers and headmasters within the district—these can be conveniently arranged by each inspecting officer for his own beat. In the light of the discussions, the plan may be modified and a final decision taken. Secondly, not all powers should be conferred on each school complex within the district simultaneously. A minimum of powers should be conferred to begin with. Where good work is shown—as will be done in many complexes—additional powers may be delegated. On the other hand, if for some reason or the other the complex does not function properly—and some are bound to create difficulties—it may even be desirable and necessary to withdraw the powers. Given proper leadership on the part of the District Education Officer and his staff and persistent effort, the scheme is bound to succeed.

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[1] Chapter II.

10.42. The great advantages of the school complex are obvious. But like all human things, it has its dangers also. If the dominant headmasters in any unit happen to be thorough-going educational conservatives, the imaginative classroom teacher may find himself less able to experiment under the system of school complex than he is at present. This is a risk that must be run. It will be for the District Educational Officer (if he is not also a thorough-going conservative) to throw his influence in favour of a more liberal policy. It must also be remembered that the kinds of group reform that will get the blessing and support of a committee of headmasters will tend to be more stale and conservative than those that might be generated by an adventurous individual or single school. The Education Department must, therefore, make it amply clear that the purpose of the school complex scheme is not just to encourage a unit to experiment *en bloc* but also to foster individual experimentation within the unit.

10.43. It is also necessary to note that the proposal involves additional expenditure. For instance, we expect the headmasters and teachers of the high schools to visit the higher primary schools in the neighbourhood on an average, say, of once a month, and some lower primary schools in the same manner. We also expect that similar visits would be paid by the headmasters of the higher primary schools to the lower primary schools in the neighbourhood. Some payment will have to be made on this account. The programmes of in-service education we have suggested will also involve expenditure. If the students of the primary schools are to be taught science in the high school laboratory during vacations, some payment will have to be made to the teachers concerned. But the scale of this expenditure will not be large and it will yield good results.

10.44. **The New Supervision.** Supervision is, in a sense, the backbone of educational improvement. Unfortunately, the programme of supervision of schools has largely broken down in most States for several reasons such as:

- —the large expansion in the number of institutions which has not been accompanied by a corresponding increase in the number of inspecting officers;
- —the combination of administrative and supervisory functions in the same officer which affects supervision adversely because administrative work, which has increased greatly in recent years, always has a priority;
- —the use of supervisory officers, when they are members of the block development team, for non-educational work, leaving them very little time for their own responsibilities;
- —continuance of old techniques of supervision oriented to control rather than to development; and
- —lack of adequate competence in the inspecting staff.

One of the major programmes in the reform of school education is to overcome these difficulties and to create the new system of supervision.

10.45. **Separation of Administration from Supervision.** One important recommendation, *i.e.*, separation of administration from supervision has already been made and we have suggested that the District School Board should be largely concerned with the former and the District Education Officer and his staff, with the latter. These two wings should work in close collaboration. When differences arise, the last word will lie with the District Educational Officer, who will have a higher status, or with the Director of Education. Under this arrangement, it will be possible for the District Educational Officer and the staff to concentrate on supervision proper *i.e.* on improvement of instruction, guidance to teachers, organization of their in-service programmes and provision of extension services to schools.[1]

10.46. **Recognition of Schools.** It is also important that there should be nothing like 'automatic' recognition of schools. At present, there are rules or conventions in several States under which every school conducted by government is deemed to be automatically recognized. Such rules or conventions are also applicable to all local authority schools in some areas. In our opinion, there is no justification for this procedure. Recognition is a privilege which has to be deserved and continuously earned by every school, irrespective of its management. Under our proposals, there will be no government schools as all of them will be transferred to the District School Boards. We expect the private schools and all the local authority schools under the District School Boards to apply to the Department of Education for recognition. The Department will prescribe the conditions for recognition, and on the basis of these, will grant or refuse recognition on merit. The Department will also periodically inspect all recognized schools to ensure that the prescribed standards are being maintained.

10.47. **Types of Inspections.** At present only one common form is adopted for all supervision, which is too elaborate for the annual inspection but too sketchy for a thorough or quinquennial inspection. We propose that in future every school should have two types of inspections—annual and triennial—and two different forms should be used for the purpose. The annual inspection will be more or less a departmental affair and will be carried out by the officers of the District School Boards for the primary schools and by the officers of the State Education Departments for the secondary schools. In addition, there will be a thorough triennial or quinquennial inspection of every school. This will be organized by the District Educational Officer for the primary schools, and the panel will consist of an inspecting officer of the Department and two or three headmasters or teachers of primary and secondary schools selected for the purpose. In the case of secondary schools, this will be organized by the State Board of School Education and the panel will consist of an officer of the Department and some selected headmasters/educationists/teachers.

10.48. **Flexibility.** One of the main characteristics of the new approach to supervision will be its flexibility in the treatment of different schools. It will have to provide support and guidance to the weaker schools, lay down guide-lines of progress for the average schools, and give freedom to experiment to the good schools. It will have to assume responsibility for extending the process of continually deepening the curricula from school to school and of diffusing new methods of teaching which have been discovered and have proved their efficacy. The responsibility of the supervision for these significant tasks and the manner in which it can discharge it satisfactorily have already been discussed in the preceding two chapters. We may re-emphasize, in this context, the need for the provision for guidance and extension services to schools which becomes one of the major responsibilities of the new supervision; and it is from this point of view that we have recommended that the district and *not* the Directorate of Education should become the chief unit for school services.

10.49. If this new supervision is to become a reality, the quality of supervising officers will have to be considerably improved. Three measures will be needed from this point of view. Two of these, namely, upgrading the qualifications of inspecting officers and the appointment of specialists, have already been referred to. The third is the need to provide in-service training for all supervisory and administrative officers. This function would have to be performed, as will be discussed later, by the State Institutes of Education and the National Staff Colleges for Education Administrators.

REORGANIZATION OF STATE EDUCATION DEPARTMENTS: STATE LEVEL

10.50. **State Institutes of Education.** The district educational officer will receive guidance and advice from the headquarters principally through two main channels. The first is the Directorate proper which will give him the necessary instructions in all administrative and financial matters; and the second is the State Institute of Education which is a part of the Directorate and forms the principal academic wing of the Department. In so far as the administrative supervision over the districts is concerned, we have already recommended extensive delegation of authority to the district. With regard to the academic guidance to be given to district officers, there was no organization for the purpose at the Directorate level until the State Institutes of Education were established. These are still new and feeling their way. A few words about the need, functions and proposed development oi these Institutes will, therefore, be in place.

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[1] Where the District School Boards have not been set up, it would still be advantageous to have two separate teams of officers—one for administration and another for supervision—rather than combine both the functions in one set of officers.

[2] For details, see Chapter XVIII.

10.51. It is now universally recognised that the Education Departments have need of an academic wing and that it should be staffed by experts in different fields who can make their expertise available to field officers, teachers and headmasters. Some steps in this direction have already been taken. For example, there are special inspectorates for Physical Education and Audio-visual Education. Subject-inspectors have been appointed in some States. Most States have State Institutes of English. (for improving the standards of English), Vocational Guidance Bureaux (for providing guidance services and for training school counsellors), and Evaluation Units (for the improvement of examinations). Recently, steps have been taken to establish Institutes of Science also. In one or two States, there are also Bureaux of Curriculum Research: and in some States, a separate machinery has been set up for the production of textbooks and instructional materials. There is therefore, hardly any need to make out a case for the establishment of functional inspectorates or bureaux in the State Education Departments. On the other hand, there is need to introduce harmony and order in a situation which, in some cases at least, is becoming a little chaotic.

10.52. There were solid reasons for establishing comprehensive State Institutes of Education as replicas of the National Council of Educational Research and Training recently established at the Centre. Each of the different organizations set up at the State level is small and not very viable. Consequently, they are often ineffective, and the coordination of the programme of a large number of such small and different organizations is difficult. This will be overcome if they can be integrated with the State Institute of Education. Similar developments took place at the Centre during the first three plans. A beginning was made with a large number of separate institutions established for small specific purposes. As these did not prove to be effective enough, they were combined under a single organization which has been designated as the National Council of Educational Research and Training. This has been a progressive step and has yielded good results. A time has now come to take a similar step at the State level also.

10.53. The following sections or programmes will have to be developed in the academic wing of the Education Department, preferably in the State Institute of Education but, if necessary, outside it:

(1) *In-service Education of Departmental Officers.* Provision of in-service training for all officers of the Department and to all teacher educators (whether in public or in private schools).

(2) *Improvement of Teacher Education.* For this purpose, it has already been suggested[1] that each State Government should establish a State Board of Teacher Education, which should work in collaboration with the State Institute of Education.

(3) *Curricula, Textbooks, Guidance and Evaluation.* It is also necessary to set up a competent and adequate agency for dealing with curricula, textbooks and evaluation. The textbook production part of this agency should preferably take the form of an autonomous organization, operated on a commercial basis but on the principle of no profit and no loss.

(4) *Research and Evaluation of Programmes.* At present, this is a mostly a neglected area. It would be a responsibility of the State Institutes of Education to develop these programmes, in collaboration with the universities and training colleges.

(5) *Publications.* These would deal with educational problems and will have to be brought out on a large scale, in the modern Indian languages.

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[1] Chapter IV

STATE AND NATIONAL BOARDS OF EDUCATION

10.54. **Educational Standards.** One of the major objectives of educational development is to secure a continuous improvement in standards. To initiate and carry on this process within the programme for school improvement, an adequate machinery at the State level is needed for defining, revising and evaluating educational standards, expected as well as attained. A suitable organization at the national level is also needed to stimulate, coordinate and guide this work. It is to these proposals that we shall now turn our attention.

10.55. Educational standards are of three kinds:

—'expected' educational standards, defined in terms of specific educational goals and subject-matter content and made more explicit in syllabuses, textbooks, teachers' guides and other learning materials; and

—'accomplished' educational standards, defined in terms of students' performance as measured by examination and other evaluation instruments.

—'projected' educational standards defined in terms of the expected or accomplished standards at some future date, say five or ten years hence, as a part of a programme of continual improvement of standards.

10.56. The definition and measurement of these educational standards at the national level can materially help in raising the standards of the educational system as a whole in the following ways:

(1) The expected and projected national standards will provide definite targets for educational attainments at different stages of education at given periods, on the basis of which State Governments may formulate their own expected standards of attainment at all levels and at different periods.

(2) The national standards may be useful in establishing general comparability of educational attainment between different States.

(3) The formulation of national standards and their continual appraisal can be useful in educational planning. In particular, projected educational standards can be worked out at the national level with a phased programme for the attainment of higher standards from one plan period to another.

(4) The measurement of accomplished educational standards may also help in establishing national norms of educational performance of students at various levels and in various subjects, and thus provide an objective appraisal of the educational progress of the individual States and of the nation as a whole, and make inter-State and international comparisons possible. Longitudinal studies of accomplished standards on the basis of norms and dispersion are the only means of forming valid objective judgments as to whether educational standards have deteriorated, remained stationary, or been raised over a period of years. In a developing country, the need for the establishment of such a procedure for the measurement and evaluation of educational standards is obvious.

10.57. **State and National Standards.** Assuming the need to plan and implement a programme on the above lines, it becomes necessary to decide the levels at which these standards should be defined. We recommend that, to begin with, they should be defined at two levels; at the end of the higher primary stage and at the end of the lower secondary stage (or at the level of the present secondary school leaving examination). When the higher secondary stage will cover a period of two years and we have twelve years of schooling everywhere prior to admission to the university, it will become necessary to define standards at the end of the higher secondary stage also.

10.58. We further visualize the following steps to be taken:

(1) All these standards should be prescribed, to begin with, by the State Governments in the light of local conditions.

(2) The State Governments will create an adequate machinery at the State level for defining these standards, for measuring them and for their periodical revision. They will also define projected standards at these levels from time to time. This machinery will consist of the State Evaluation Organizations and the State Boards of School Education.

(3) There will be a National Board of School Education which will coordinate the national standard and assist the State level organizations to develop a programme of continuous improvement of standards. The work will begin with the standard at the end of Class X, then extend to the standard at the end of Class VII/VIII and finally to that at the end of Class XII.

(4) To begin with, there may be wide gaps in the standards defined in the different States at each of these levels. But as the work develops, these gaps will tend to diminish and the standards attained in different States at these levels will tend to come closer together. We would, however, like to emphasize that the concept of a national standard implies only a minimum below which no State should be allowed to fall, and does not connote a uniformity which all States should accept for all time. On the contrary, it is presumed that every State will aim as high as possible, and that the minimum standards prescribed will themselves rise continuously.

10.59. **State Evaluation Organization.** With a view to implementing this programme, we recommend that a State Evaluation Organization should be set up in each State broadly on the lines of the Central Testing Organization for higher education which we have recommended for establishment on a national basis. A beginning in this direction has been made already through the establishment of State Evaluation Units. These have been located, sometimes in the Departments and sometimes in the State Boards of Secondary Education. We find that difficulties arise in both cases. When the Unit is set up as a part of the Department, if fails to develop a close relationship with the Board of Secondary Education which is the most important examining body in the State. On the other hand, when it is established in the Board, it tends to lose contact with the schools and with the programme of improving evaluation throughout the school stage and particularly at the primary level. We are, therefore, of the view that the State Evaluation Organization should be set up as an independent institution, preferably autonomous, and its services should be available to all concerned—Boards of Secondary Education, District Education Officers who are in charge of improving evaluation techniques in primary and secondary schools, and the schools themselves.

10.60. The main function of the State Evaluation Organization will be to assist the State Education Departments in prescribing, revising and measuring educational standards. From this point of view, it will

- —help the District Education Officers improve the evaluation practices in primary and secondary schools; and
- —help the State Boards of School Education improve the external public examinations conducted by it, particularly the examinations at the end of Class X and Class XI/XII.

10.61. We have discussed earlier the manner in which evaluation practices in primary and secondary schools and the external public examinations conducted by the Boards of Secondary Education at present are to be improved[1]. This will be the principal responsibility of the District Education Officer who will have, on his staff, at least one specialist officer in evaluation. The State Evaluation Organization will assist in these programmes by:

- — preparing and keeping in stock a rich supply of evaluation material, including standardized achievement tests and making it available to all concerned;
- — by co-operating with the training colleges in providing training to prospective teachers in new techniques of evaluation;
- — by co-operating with the State Institutes of Education in providing in-service education in new techniques of evaluation to all inspecting officers;
- — by conducting training programmes for specialist officers of the Department in evaluation, headmasters of schools, and examiners and paper-setters of the State Boards of School Education; and
- — conducting research relating to problems of evaluation at the school stage.

10.62. The State Evaluation Organization will advise the State Education Department on the curricula for and the expected standards at the end of the higher primary and lower secondary stages. It will also advise the Department on the preparation of textbooks and other teaching and learning materials. In addition, it will be its sole and important responsibility to measure the accomplished standards at the end of the higher primary and lower secondary stages from time to time and publish reports about the manner in which they vary from block to block or district to district in the State. Needless to say, these periodical and objective assessments of accomplished standards will be an important tool in improving standards continuously.

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[1] Chapter IX.

10.63. It will be a responsibility of the State Government to establish the State Evaluation Organization. It will be headed by a senior officer of the Education Department specially trained in modern evaluation techniques and will have an adequate staff provided to him for this purpose. It will have an Advisory Committee presided over by the Chairman of the State Board of School Education and consisting of some District Education Officers, teachers (primary and secondary) and educationists interested in the problem.

10.64. **State Boards of School Education.** We recommend that, in each State, a State Board of School Education should be established and it should take over the functions and the responsibilities of the existing Boards of Secondary Education and allied agencies. It should consist of a full-time chairman, representatives of Departments (other than education) which may be in charge of education (*e.g.*, medicine, industries, agriculture, etc.), some senior officers of the Department, representatives of the universities, representatives of the District School Boards, headmasters and teachers of secondary and primary schools, and educationists. It should have two full-time secretaries—one for the administrative section to be in charge of all the routine work of holding examinations, and the other to be in charge of the academic unit which will be mainly concerned with the periodical inspections of secondary schools and with the improvement of examination in collaboration with the State Evaluation Organization. The Board should be established by law and should have large powers and freedom to enable it to function and discharge its responsibilities satisfactorily. This would be greatly facilitated if its finances are not treated as government revenue and credited to the treasury (as in Mysore), but are pooled together in a separate fund managed and maintained by the Board (as in Maharashtra).

10.65. With regard to the appointment of the chairman of the Board, one view was that the Director of Public Instruction should be *ex-officio* chairman of the Board on the ground that this will lend status to the Board, integrate its work adequately with that of the Department and make the implementation of its policies easier. While we accept the need for a close liaison between the Board and the Department, we think that the Director is otherwise too busy to devote adequate time to its work and that the responsibilities of the Board are so heavy that it needs a full-time officer. The choice, therefore, lies between two practices, each of which has certain points in its favour. The first and the more commonly adopted practice is to appoint a senior officer of the Education Department of the status of a Joint or Deputy Director as the chairman of the Board. The other is adopted in Rajasthan where the chairman is a non-official, has the status of a Vice-chancellor and is also appointed in accordance with the same procedure. There is also a third possibility that the chairman should be an eminent educationist and a non-official but that he should be given an adequate status in the Department after his appointment. There is obviously room for experimentation here and we would not like to insist on any particular method of appointing the chairman. On one point, however, we are all agreed: the Board has to function as an integral part of the Department. The standards in schools will not rise unless the State Board of School Education (which is a professional body with authority to prescribe standards and curricula and to hold examinations), the State Department of Education (which has the inspectorate and provides the funds) and the District School Board (which administer the schools) work together as one team.

10.66. The State Board of School Education will be responsible for the following functions:

(1) It will advise the State Government in all matters relating to school education;

(2) It will prescribe conditions for recognition of primary and secondary schools in terms of teachers, curricula, equipment and other educational facilities;

(3) It will grant recognition to secondary schools desiring to send candidates for its examinations and to arrange for their periodical inspection.

(4) It will prescribe curricula for all school classes—from Class I to Class XII—and text books for the examinations conducted by it.

(5) It will conduct the public examinations at the end of Classes X and XI/XII and such other examinations as may be entrusted to it by the State Government.

(6) It will conduct special examinations such as those for talent search or award of scholarships.

It will be seen that we would like the Board to be in charge of the entire school stage for purposes of curricula. Such a unified approach has great advantages. With regard to the recognition of schools. however, we propose that the recognition of primary schools will be done finally by the District Education Officer. The secondary schools will need recognition from two sources—the Department and the State Board of School Education. The former. through its District Education Officers. will carry out the annual inspections. The Board will grant the first recognition to the institution and also arrange for its periodical inspection, preferably triennial, by appointing panels of teachers with which the Departmental officers would be associated. We think that a double check of this type is essential for improving standards.

10.67. One important point regarding the responsibilities of the Board deserves a closer examination. All the existing Boards of Secondary Education conduct the external public examination at the end of the lower secondary stage (Class X). The new Board will continue to do so. In addition, the Board will also have to conduct examinations in general education at the end of the higher secondary stage (Class XI or XII). Since higher secondary education would now be very largely vocationalized, the question is whether this Board should also conduct examinations for the vocational courses as well. On this point, two different views were placed before us:

(1) The first was that the sphere of the Board should include all secondary education—both general and vocational—and that it should conduct examinations even for vocational secondary education.

(2) The other view was that the scope of the Board should be limited to general education and that separate bodies should be set up for holding examinations for the vocational courses which should be integrated with higher courses in the same subject. For example, the State Board of Teacher Education would be in a better position to conduct examinations for the training of teachers.

We have given careful consideration to this problem. We feel that, in the long run, it would be desirable to bring all school education—general and vocational—within the scope of a single organization like the State Board of School Education. But this step may not be immediately practicable. We, therefore, recommend that separate organizations may be set up, for the time being, for different vocational courses at the State level. There should, however, be a close coordination between these bodies and the State Board of School Education and there should also be overlapping membership to some extent.

10.68. We think that some special arrangement is also needed for the higher secondary stage which forms the bridge between the school and the university. We, therefore, recommend that a special committee of the Board should be established to look after the higher secondary stage. Half of its members should represent the schools, and the other half, the universities. Such a body will ensure that adequate standards are maintained at this stage.

10.69. At present, some of the Boards of Secondary Education in the States take an inordinately long time in the declaration of examination results. This will have to be reduced to less than two months and for this purpose, it may be an advantage, as stated earlier to mechanize the entire process. Secondly, it may also be desirable to set up sub-boards to cover one or more districts, depending upon the number of candidates for examinations, on the pattern of the Maharashtra Board. The State Board would set the papers etc., and the sub-boards will carry on the examination and evaluation of papers under the State Board.

THE ROLE OF THE CENTRE

10.70. **Establishment of National Board of School Education.** It will be for each State Government to define, in relation to national standards, the expected standards at the end of primary and secondary stages. The principal responsibility of the Government of India would be to function in an advisory, clearing house and coordinating capacity, to promote research in the subject, and to assist in the training of the personnel of the State Education Departments engaged in this programme. This flows as a corollary from the duty and responsibility which devolves on the Government of India for the coordination and maintenance of standards in higher education. As the process of education is an integrated whole, and since high quality university education cannot be built on low school standards, no effective action in the field of higher education is possible unless similar measures are simultaneously adopted at the school stage.

10.71. In this connection, it was suggested to us that a Secondary Education Commission on the lines of the University Grants Commission, should be established. We have given careful thought to this problem and feel that this suggestion is impracticable for several reasons. For instance, the large number of secondary schools creates insurmountable administrative problems. The Constitutional position is against it. It cannot even be supported on educational grounds. The establishment of an autonomous organization like the University Grants Commission is necessary in higher education where problems of autonomy are involved. But in school education, the responsibility for the maintenance of standards has to be placed squarely on the State Governments. It will therefore, be more desirable to assist the State Governments in improving standards of school education through the Ministry of Education rather than through any autonomous organization of the type of the proposed Secondary Education Commission.

10.72. We, therefore, recommend that a National Board of School Education should be established in the Ministry of Education to advise the Government of India on all matters relating to school education. It would perform the following functions:

—define the expected and projected standards of attainment at different stages of school education;

—revise such standards from time to time in keeping with national needs and with international developments;

—evaluate the standards actually attained at the various stages of school education in the different parts of the country and ascertain the extent to which they approximate to the corresponding expected standards;

—advise and assist the State Governments to develop a programme of curricular reform, preparation of textbooks, teaching materials, and evaluation aimed, principally at raising standards at the school stage; and

—advise and assist the State Governments and other authorities to plan and implement all programmes essential for the improvement of standards in school education.

10.73 **Composition and Duties of the Board.** The Board should be organically linked with the Ministry of Education. Its full-time chairman should be an outstanding educationist, recruited from outside on the basis of professional competence, and appointed for a period of five years. On appointment, he should have the status and exercise the powers of a Joint Educational Adviser. The membership of the Board should be made up as follows:

(1) Chairman:

(2) Two representatives of the Ministry of Education and the NCERT;

(3) Two representatives of the UGC;

(4) The chairmen of different State Boards of School Education;

(5) Four practising teachers at the school stage, of whom at least one should be a primary teacher; and

(5) Three university teachers specially interested in school education.

The Board should have an adequate and competent secretariat.

10.74. The Board will work in an advisory capacity and will provide guidance to the State Education Departments in developing their programme regarding standards. It would also maintain close collaboration with the UGC and the universities.

10.75. In relation to the standards, the work of the Board would broadly be of two kinds:

— *diagnostic, i.e.*, assisting State Education Departments in measuring achievements and indicating what are the accomplished educational standards in the different parts of the country; and

— *developmental*, i.e., helping State Governments adopt measures which would assist in raising standards through such programmes as curricular reforms, textbook preparation, and examination improvement.

The developmental work should be of greater importance and we expect the Board to provide the much needed leadership for an intensive, continuous and intelligently planned programme of improving educational standards on the basis of the appraisal of educational progress, the constant study of the needs of the nation and of new developments, both in India and abroad, in various subjects. It can also help to reduce the time-lag between new developments in subject areas and their absorption in the education system. Since one of the most significant tasks in the proposed educational reconstruction is to raise standards, we recommend the early establishment of this Board which has to function as a catalytic agent in the process of education at the school stage.

10.76. **Programmes in the Centrally-Sponsored Sector.** We also recommend that there should be a fairly large programme, in the centrally-sponsored sector, for the development of school education, particularly in secondary education. Some of these programmes are indicated below.

(1) *Development of Vocational Education*. As we have repeatedly stressed in this Report, secondary education has to be largely vocationalized. This process would be expedited if the Government of India were to offer grants to State Governments for the establishment of vocational institutions at the secondary stage on a matching basis. This has already been discussed.[1]

(2) *Secondary Schools with Optimum Standards*. Another purpose of assistance under the centrally-sponsored sector would be the establishment of quality schools. At present, the Government of India is establishing a number of secondary schools in different parts of the country which are mainly meant for the children of Central Government employees. But this programme will be very inadequate to meet total needs. We believe that it is the responsibility of the Government of India to assist State Governments establish a number of good quality institutions. We have explained earlier how a nation-wide movement for school improvement should be developed over the next ten years and recommended a target of raising at least 10 per cent of institutions to a higher level and establishing at least one good secondary school in each community development block. We suggest that State Governments should be requested to prepare concrete phased programmes for this purpose and that the finances needed should be shared between the Centre and the State Governments on a matching basis during the next two plans.

(3) *Scholarships*. We have recommended already that, for the next two plans, there should be a centrally-sponsored programme for the development of scholarships at the school stage.[2]

(4) *High Level Examinations*. The Central Board of Secondary Education should conduct some high standard examinations in individual school subjects at two levels—Classes X and XII—in consultation with the National Board of School Education. Curricula for these examinations should be prescribed in relation to the national standards For instance, these may be related to the projected national standards five or ten years hence or what is attained in some of the best schools in the country under the present standards. A beginning may be made with mathematics and science subjects and other subjects may be included in the programme in due course. It should be open to the student of any recognized secondary school in the country to appear at these examinations and he should be awarded a certificate about his performance therein, separately for each subject. We trust that such examinations, when instituted, would gradually become more popular and would help in raising standards.

INDEPENDENT AND UNRECOGNIZED SCHOOLS

10.77. **Educational Institutions Outside the Common School System of Public Education.** Private schools have a right to exist under the present Constitution, irrespective of the fact whether they are or are not recognized or aided by the State. For instance, Article 30 lays down that 'all minorities, whether based on religion or language, shall have the right to establish and administer educational institutions of their choice' and that these shall not be discriminated against in matters relating to grant-in-aid on the ground that they belong to such minorities. Articles 28(1) and 28(2) imply that all citizens shall have the freedom to establish private educational institutions in order to provide religious instruction of their choice. The right to establish private schools for any purpose whatsoever has also been given to all citizens under clauses (c) and (g) of Article 19 which provide that all citizens shall have the right 'to form associations' and 'to practise any profession, or to carry on any occupation, trade or business' and which obviously cover the right of individuals and groups to establish and conduct educational institutions of their choice. Private schools may, therefore, be established under these provisions of the Constitution and, if they do not seek aid or recognition from the State, they will have to be treated as being outside the national system of public education.

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[1] Chapter VII.

[2] Chapter VI.

10.78. These institutions can be divided into two convenient groups: independent schools, and unrecognized institutions.

10.79. **The Independent Schools.** The independent schools generally charge high rates of fees, pay higher scales of salary to their teachers and adopt English as the medium of instruction. The number of these schools is almost microscopic in relation to the total number of educational institutions in India. But they have a very high prestige, partly because of their standards and traditions, but mainly because the children of the most powerful groups in society attend them. As stated earlier, these schools create an important problem in social integration by segregating the richer classes from the rest of the community. As a partial step to mitigate this evil, the Government of India has started a programme of scholarships under which about 200 gifted students a year are selected under a national competition and sent to the independent schools. The number of these students is too small to produce any noticeable impact.

10.80. **The Unrecognized Institutions.** These form a very heterogeneous group about which little is known. It includes, for instance, a large number of pre-schools in urban areas which do not seek recognition; coaching classes of various types which do more harm than good; private institutions which are striving for recognition but whose standards are so bad that they have not been able to earn it; institutions which insist on a form of religious instruction that is contrary to the Constitution or are restricted to certain castes or communities; and some institutions which deliberately desire, for some reason or the other, to remain outside the official system of education. Some of these do useful work; but others make a negative contribution to education and society. It is not possible, under the provisions of the Constitution to prevent such schools from coming into existence. The State Education Departments cannot control them at present because they seek neither recognition nor aid. But a time has probably arrived when the first steps towards ultimate regulation have to be taken and it may be desirable to introduce legislation for the compulsory registration of all educational institutions and to make it an offence to conduct an unregistered institution. Power should also be vested in the State Government to remove any educational institution from the register on all or any of the following grounds: (1) the school premises or any parts thereof are unsuitable for a school; (2) the accommodation provided at the school premises is inadequate or unsuitable, having regard to the number, ages and sex of the pupils attending the school; (3) efficient and suitable instruction is not being provided at the school having regard to the ages and sex of the pupils attending thereat; and (4) the proprietor of the school or any teacher employed therein is not a proper person to be the proprietor of an independent school or to be a teacher in the school, as the case may be. But before the final decision to remove the institution from the register is taken, it should be served with a notice specifying the charges against it and giving it adequate time to comply with the requirements. It should also have the right to appeal to a special tribunal set up for the purpose. This modest measure would serve the immediate need of the situation and further action may be taken in the light of experience gained.[1]

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[1] The proposals made above are based on the Education Act, 1944 in England.

CHAPTER XI

HIGHER EDUCATION: OBJECTIVES AND IMPROVEMENT

I. *Objectives of Universities.* (1-2)

II. *Universities in India.* (3) Historical development; (4) Special responsibilities; (11) Programmes of development.

III. *Some Problems to be Faced.* (12-16)

IV. *Establishment of Major Universities.* (17) Proposal; (26) Implementation; (28) Recruitment of students; (30) Recruitment of staff; (31) Centres of Advanced Study; (32) Provision of facilities; (33) Some general suggestions; (34) Extension of excellence to other departments, (35) Financial support.

V. *Improvements of Other Universities and Affiliated Colleges.* (37) Supply of teachers for higher education; (37) Development of other universities; (40) Development of affiliated colleges.

VI. *Improvement of Teaching and Evaluation.* (42) Improvement of teaching; (44) Development of libraries; (50) Experimentation; (51) Teaching methods; (52) Examination reform; (58) Medium of education.

VII. *Student Services.* (64) Orientation of new students; (65) Health services; (67) Hostels and day-study centres; (69) Guidance and counselling; (71) Student activities; (72) Administration of welfare services; (73) Student unions; (77) Student discipline.

OBJECTIVES OF UNIVERSITIES

11.01. Pandit Jawaharlal Nehru, in his convocation address to the University of Allahabad in 1947, thus summed up the basic objectives of the university and its role in national life: 'A university stands for humanism, for tolerance, for reason, for the adventure of ideas and for the search of truth. It stands for the onward march of the human race towards even higher objectives. If the universities discharge their duties adequately, then it is well with the nation and the people'. These great words highlight the basic truth that universities have a crucial part to play in the life, welfare and strength of a nation. They can, however, fill this role only if they owe uncompromising loyalty to certain fundamental values of life. They are essentially a community of teachers and students where, in some way, all learn from one another or, at any rate, strive to do so. Their principal object is to deepen man's understanding of the universe and of himself—in body, mind and spirit, to disseminate this understanding throughout society and to apply it in the service of mankind. They are the dwelling places of ideas and idealism, and expect high standards of conduct and integrity from all their members. Theirs is the pursuit of truth and excellence in all its diversity—a pursuit which needs, above all, courage and fearlessness. Great universities and timid people go ill together.

11.02. While the fundamental values to which the universities owe their allegiance are largely unrelated to time or circumstance, their functions change from time to time. In the rapidly changing contemporary world, universities are undergoing profound changes in their scope, functions and organization and are in a process of rapid evolution. Their tasks are no longer confined to the two traditional functions of teaching and advancement of knowledge. They are assuming new functions and the older ones are increasing in range, depth and complexity. In broad terms, the functions of the universities in the modern world may be said to be:

— to seek and cultivate new knowledge, to engage vigorously and fearlessly in the pursuit of truth, and to interpret old knowledge and beliefs in the light of new needs and discoveries;

— to provide the right kind of leadership in all walks of life, to identify gifted youth and help them develop their potential to the full by cultivating physical fitness, developing the powers of the mind and cultivating right interests, attitudes and moral and intellectual values;

- to provide society with competent men and women trained in agriculture, arts, medicine, science and technology and various other professions, who will also be cultivated individuals, imbued with a sense of social purpose;
- to strive to promote equality and social justice and to reduce social and cultural differences through diffusion of education; and
- to foster in the teachers and students, and through them in society generally, the attitudes and values needed for developing the 'good life' in individuals and society.

UNIVERSITIES IN INDIA

11.03. **Historical Development.** The ancient universities in India were leading centres of learning in the contemporary world and attracted scholars and students from other countries. So did some famous centres of Islamic learning in the mediaeval period. But unfortunately these traditions did not survive and the modern universities were established, more than a hundred years ago, as exotic institutions created in imitation of the London University as it then was. The earliest of these were the Universities of Bombay, Calcutta and Madras—all founded in 1857—and the University of Allahabad, founded in 1887. They all began as purely examining bodies and continued to be so till the opening of the present century when the Indian Universities Commission was appointed (1902) and the Indian Universities Act was passed (1904). As Lord Curzon observed: 'How different is India! Here the university has no corporate existence in the same (*i.e.*, as in Oxford or Cambridge) sense of the term; it is not a collection of buildings, it is scarcely even a site. It is a body that controls courses of study and sets examination papers to the pupils of affiliated colleges. They are not part of it. They are frequently not in the same city, sometimes not in the same province[1]'. The Government Resolution on Educational Policy (1913) accepted the need for establishing more universities. It said 'The day is probably far distant when India will be able to dispense altogether with the affiliating universities. But it is necessary to restrict the area over which the affiliating universities have control by securing, in the first instance, a separate university for each of the leading provinces in India and secondly to create new local teaching and residential universities within each of the provinces in harmony with the best modern opinion as to the right road to educational efficiency'. As a result of this policy, six new universities came into existence between 1913 and 1921. A teaching, unitary and largely residential university was established at Lucknow (1920). Recognition was also given to the efforts made by eminent Indians to break new ground in creating teaching universities. For instance, the Banaras Hindu University, founded by Pandit Madan Mohan Malaviya, was incorporated in 1916 and the Aligarh Muslim University, founded by Sir Syed Ahmed Khan, was incorporated in 1920. In the meanwhile, two princely States also established universities for their areas, Mysore in 1916 and Osmania in 1918, the latter making history by the adoption of Urdu as the medium of education[2]. After 1921, when education was transferred to Indian control, the development of universities was much faster and during the next 26 years, nine more universities were established. After the attainment of independence, there has been a much more rapid expansion in the field of higher education. The number of universities has increased from 19 to 64. In addition, nine institutions have been 'deemed to be universities' under Section 3 of the UGC Act. The details about these will be found in the note at the end of this chapter. But even this expansion has not fulfilled the needs of the situation.

11.04. **Special Responsibilities.** The general objectives of university education given earlier apply equally to Indian universities. They have, in addition, some special responsibilities in the present state of our social and educational development. First and foremost, they must learn to strive to serve as the 'conscience of the nation', as assessors of the national way of life, and this responsibility becomes all the more greater in the absence of an enlightened public opinion. There are so many new pulls and forces (as well as old ones) operating in our national life—as, indeed, in the life of man as a whole—that its balance has become very precarious; and there is a danger of losing our bearings unless universities are able to play this role adequately by involving themselves deeply in the study and evaluation of the social process. Such involvement is vital since the universities are pre-eminently the forum for a critical assessment of society—sympathetic, objective, unafraid—whose partiality and motives cannot be suspected. So far, the Indian universities have not performed this function adequately. This may be due either to apathy or failure to recognize the importance of this role or to the traditional belief that scholarship and academic excellence thrive only in isolation from the clamour of the multitude. In some cases, an apprehension of the displeasure of the authorities or influential vested interests, which may not take kindly to their opinions and criticisms, may also have worked as a deterrent. To discharge this function properly, the university teachers should cultivate not only intellectual integrity, courage and scientific knowledge but also win public confidence. Unless they have the high ambition to make an impact on the quality of social thinking and endeavour, they will not be able to help in moulding a new society which will not merely cherish high values but actually provide opportunities for living by them. For this purpose, it is necessary, as a first step, to develop the universities themselves into communities where such values are prized and practised.

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[1] *Lord Curzon in India*, Vol. II, p.35.

[2] The S.N.D.T. Indian Women's University was founded by Maharshi Annasahib Karve in 1916 and it used Marath and Gujarati as the media of education. It was, however, incorporated much later in 1949.

11.05. From this point of view, the universities must learn to encourage individuality, variety and dissent, within a climate of tolerance. Dissent there is, even now, but usually of a superficial or sensational kind of which many manifestations can be seen in India and abroad. The general tendency, however, is to produce the 'organization man' who is afraid to challenge the accepted pattern of social behaviour and social institutions at the intellectual level and who is too often anxious to worm himself into the good graces of the people who count so that he may be able to 'get on' in life. A university should have no truck with this type of mind. Its business is not primarily to give society what it *wants* but what it *needs* and obviously they are not always identical. It is not a 'community service station', passively responding to popular demands and thereby endangering its intellectual integrity. Nor is it an ivory tower into which students and teachers can withdraw for a time for teaching or research, accepting no responsibility for the improvement of society. It has to maintain an ambivalent position, balancing itself carefully between commitment and detachment —commitment in action, detachment in thought. It must always be in a constant state of creative *tension* knowing where to interpret, where to criticise, where to pioneer and where to support traditional values. It can neither identify itself with the existing environment and institutions, nor yield uncritically to every kind of change, every passing pressure. This would be to surrender its basic integrity of outlook and judgment. It must ever stand ready to assimilate the new that is healthy and to eschew the old that is diseased. Such an attitude is challenging and can be unpleasant, for it needs courage to reject unduly complacent images of one's individual or national life and overcome the many emotional blocks in the mind. The university can play this role adequately if it has faith in the power of the mind and helps others to share this faith. It must encourage, not only in its students but also in the general public, so far as possible, free and disinterested thinking which can challenge vested interests and established ways. This is the only way which holds out some hope that man will be able to live wisely and intelligently.

11.06. Another special responsibility of the Indian universities is to develop programmes of adult education in a big way and to that end, evolve a wide-spread network of part-time and correspondence courses. The universities have to provide these courses in all their faculties, not only as extra-mural preparation for their examinations, but also as programmes of in-service education of professional workers in all walks of life. General adult education programmes are also needed to create a unity of outlook and faith between the masses and the intelligentsia. An extension programme would include provision for training the intermediate leadership groups which, in the circumstances of today, may not be in a position to enter the university but on whose understanding of, and identification with, national problems, the future of the country largely depends. Above all, it will require that universities function as agencies for a deep and careful study of local, regional and national problems, to which Government, public and private organizations and industry, may turn for advice and guidance.

11.07. Yet another responsibility of the Indian universities in the present context is to strive to assist the schools in their attempts at qualitative self-improvement. For this purpose, universities should conduct experimental schools, run advanced courses for teachers in various school subjects, assume greater responsibility for the training of teachers at all levels, organize summer institutes for their in-service education, assist in the search for and development of talent, and develop new curricula, textbooks and teaching materials. These programmes of extension and school improvement have been discussed in detail elsewhere.[1]

11.08. Perhaps the most onerous responsibility which the Indian universities now have is to shake off the heavy load of their early tradition which gives a dominant place to examinations, to improve standards all-round and by a symbiotic development of teaching and research, to create at least a few centres which would be comparable to those of their type in any other part of the world. This alone would help to bring back the 'centre of gravity' of Indian academic life within the country itself. We can do no better than to quote Sir Eric Ashby on this subject:

> Looking at Indian Universities a century after their foundation, one cannot but help feel that they have failed to adapt themselves sufficiently to the vast and unique opportunities which surround them; they seem to have lost enthusiasm and initiative under the crushing problems which have beset them. Despite three major commissions, they have not been able to extricate themselves from their own brief history. With a few notable exceptions they remain examining bodies and their students naturally regard success in examinations as the sole end of an undergraduate career. As universities multiply in number, their academic standards—relative to those elsewhere do not improve. And something even more serious than this happens: the universities remain alien implantations, not integrated into the New India as the writers of the Radhakrishnan Report (in its brilliant second chapter) hoped they might be. This is one reason why, to the observer from outside, the Indian intellectual remains a culturally displaced person, nostalgically treasuring his threads of communication with England. Notwithstanding the fact that the leadership of modern India is in the hands of statesmen more intellectual than perhaps are to be found in any other nation, there is in India (as Edward Shils recently wrote) 'no intellectual community'. This is due in part to the lack of a hierarchy of cultural institutions in the country: and this in turn is related to the fact that the universities have responded too weakly to the challenge of Asiatic culture.
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> This failure of the university to meet the challenge of Indian society has many complex causes, but among the causes are undoubtedly the decisions made between 1835 and 1854. To exclude from university studies for half a century the whole of oriental learning and religion and to purvey to Hindus and Moslems a history and philosophy whose roots lie exclusively in the Mediterranean and in Christianity; to communicate the examinable skeleton of European civilization without ensuring that the values and standards which give flesh to these bones are communicated too; to set up the external paraphernalia of a university without the warmth and fellowship of academic society: these are the handicaps against which Indian universities are still struggling and which prevent the university from becoming the centre and focus of India's intellectual life.[2]

11.09. The responsibilities we have discussed so far are those which are specially related to higher education and they should be read together with the general objectives of education stated earlier[3] to which all stages of education must contribute in some measure. For instance, the Indian universities must foster national consciousness. They should ensure 'that every student who passes out of an Indian university takes with him some understanding of India's cultural heritage, its past achievements and triumphs in the field of art, philosophy, science and so on. He should, in other words, know what he is heir to. This could, perhaps, best be done at the first degree stage where such a study could form a part of a programme of liberal education. It is noteworthy, in this connection, that all university students in America have to take a course in western civilization'[4].

11.10. We are convinced that a keen awareness of these responsibilities of the universities on the part of all university teachers and students is indispensable to the renovation of higher education we have in view. If we may say so, these are a challenge to the conscience of the university men and women and we trust it will be taken up in all seriousness.

11.11. **Programmes of Development.** To realize these ambitious objectives is no easy task. To do so in all our universities would need an order of investment in physical and monetary terms which is now beyond our reach and a large number of highly qualified and dedicated teachers who are not available. What is necessary, therefore, is a well-conceived and a comprehensive plan spread over the next twenty years and its vigorous and sustained implementation. This plan would include, amongst others, the following programmes which have high priority:

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[1] Chapters VIII to X and XVII.

[2] *The Bulletin of International Association of Universities*, November, 1962.

[3] Chapter I.

[4] *Report on Standards of University Education*, UGC, New Delhi, 1965, pp. 4-7.

- a radical improvement in the quality and standards of higher education and research;
- expansion of higher education to meet the manpower needs of national development and to some extent, the rising social ambitions and expectations of the people; and
- improvement of university organization and administration.

We shall discuss these problems seriatim in this and the next two chapters.

Some Problems to be Faced

11.12. There is a general feeling in India that the situation in higher education is unsatisfactory and even alarming in some ways, that the average standards have been falling and that rapid expansion has resulted in lowering quality. The examination results, the reports of Public Service Commissions, the views of employers and the assessment of teachers themselves, the results of research done—all seem to support this conclusion. In view of the difficulties inherent in the objective measurement of standards over a given period and as no serious attempt to measure standards has been undertaken so far, it is difficult to say definitely to what extent and in what respects, they have been falling. What is, however, apparent and really matters is that over a large area of education, the content and quality are inadequate for our present needs and future requirements, and compare unfavourably with the average standards in other educationally advanced countries. What is worse, the large gap between the standards in our country and those in the advanced countries is widening rapidly. Many of our educationists and public men, however, have not fully realized how serious are the actual conditions, academic and physical, that obtain in the colleges and universities. Even those who are broadly aware of the situation, fail to notice its poignancy because they have become used to such conditions. It would, therefore, be useful to describe them briefly.

11.13. The existing situation in higher education during the academic year broadly alternates between slackness and strain—slackness during the session, strain at the time of examinations. In many of the weaker colleges and universities, a majority of teachers teach mechanically and listlessly. The subjects in which they lecture do not often involve their intellectual passion. They do not usually have a part in the formulation of the syllabus which they are required to teach, nor do they make—with a few bright exceptions—experiments in methods of teaching. There is little enthusiasm for learning or discovery of new truths because research is not considered an integral part of their duties and whatever research is done is usually of unconvincing quality. In the absence of a 'research impregnated' atmosphere, even the intellectually ambitious younger members of the staff are soon caught up in the general atmosphere of indifference or cynicism. A large proportion of teachers suffer from financial worries—particularly in colleges where grades are low—and are often unable to buy any books or journals. Even the physical conditions of work discourage serious, undistracted study or intellectual dialogue with their colleagues. Usually, there is one staff common room which is not large enough even to accommodate all the members of the faculty. In some of the institutions, there are additional factors which are uncongenial for the development of intellectual vitality. The hierarchical concentration of authority within the departments and colleges, the atmosphere of distrust between senior and junior teachers, the cynicism about administrative authorities, the unseemly conflicts about offices and positions and the attitude of envy towards persons of superior attainments—all have contributed to the deadening of the spirit of intellectual curiosity and adventure. Some of the members are diverted from intellectual concerns into intrigue and conflict over the small administrative or financial prizes afforded by Indian academic life. On top of all this, the bureaucratic structure within which research has to be done, the dependence on the approval of indifferent superiors, the elaborate procedures through which equipment made abroad has to be obtained, the difficulties in the maintenance and repair of equipment once obtained and in establishing contact with researchers working on related subjects, have all had a depressing effect on the morale of teachers and on the quality and quantity of their research output.

11.14. The situation with regard to the students is no better. Many now come from comparatively or entirely uneducated homes and are ill-prepared at the secondary level to undertake genuine university work; they have little experience of independent study; their curiosity is unquickened and learning for them is mainly a matter of mechanical memorization. There is, as a rule, little discussion of intellectual matters with their teachers or fellow students; their main duty is considered to be to attend uninteresting lectures usually given in a language which they understand inadequately. When the medium is an Indian language, there is a dearth of suitable textbooks and supplementary literature necessary to achieve competence in their subjects. Many of them cannot be expected to read textbooks in English because it has not become for them the language of the library. The capacities of the better students are not fully stretched by curricular offerings or the stimulus which inspiring teachers could provide. In addition, a large majority of students are beset with financial worries which make concentration on academic work difficult.

11.15. This may appear an exaggerated picture. But it is not. If anything, it errs on the side of underestimation. It is, of course, true that there are bright exceptions to this dark picture which one must gratefully acknowledge. But taken all in all, the ideal of academic excellence is confined to a minority of teachers and students who have to keep it alive against the downward pressure of discouraging circumstances.

11.16. This situation has been in existence for a long time. What is new is the magnitude of the problems and their accentuation as a result of the extraordinarily rapid expansion of higher education and the development of new expectations in the post-independence era. In the past, the need for a better, more effective education was not felt so keenly because, so long as India did not supply the higher cadres of its own ruling class—or did so to a limited extent—the efficiency and effectiveness of its intelligentsia was of secondary importance from the point of view of the tasks it was expected to perform. Now that the responsibility for the progress of the country squarely rests on us we cannot afford to plead any alibis. The quality of education, therefore, becomes of crucial significance. As the number of jobs and positions to be filled with highly trained persons increases, the discrepancy between need and the capacity to meet the need is widening. It is obvious that, if higher education is not radically improved, our administration and technical progress, our intellectual standards and social advance will all be most seriously handicapped.

ESTABLISHMENT OF MAJOR UNIVERSITIES

11.17. **The Proposal.** While the need to improve higher education is widely recognized, difficulties begin when one tries to discuss the remedies. The most common suggestions put forward in this regard are usually just the reverse of the defects described above. They try to bring the needed reforms into being through administrative measures, without taking into account the limited resources of finance and personnel available for such reforms or the administrative and political inhibitions operating against their realization. Indeed, it might be said without much exaggeration that many of the proposed remedies pre-suppose the existence of conditions which, if they really existed, would have made the reforms unnecessary! It is, therefore, imperative that we should adopt some new plan of action which would be both realistic and effective.

11.18. The new strategy that we propose has two important aspects. The first is the need to concentrate scarce human resources and not to scatter them over too wide an area. Even at present, our own universities and colleges produce a small number of outstanding Indian scientists and scholars who, if they were to enter upon an academic career under the right conditions, would be able to make a great contribution to the improvement of our academic standards. But, apart from the fact that they are too few compared to our inherent national capacity and our population, they are unfortunately scattered thinly and at random over the entire system of higher education and have to work in comparative isolation and under unfavourable conditions; the burden of a heavy teaching load; large classes of unchallenging students; apathetic or intellectually unambitious colleagues; and an administrative system which intentionally or unintentionally does not encourage and, in some cases, even actively discourages high intellectual vitality and motivation. The able persons, who could have provided the required leavening are thus rendered ineffectual when they are so scattered and what is worse, their own creative powers decay under such conditions. On the other hand, experience has shown that the best results follow where a goodly number of persons of high potentialities come together in face-to-face intellectual communities and, by their constant dialogue and communication, stimulate each other to put forth their best creative efforts. If there is high quality of personnel, it makes all the difference whether people work in relative isolation resulting eventually in stagnation or in vigorous self-activating groups.

11.19. The most important reform that we envisage is the development of five or six of what we may call 'major' universities where conditions may be provided, both as to staff and students as well as to the necessary equipment and atmosphere, to make first class postgraduate work and research possible. The standards of these major universities should be comparable to the best institutions of their type in any part of the world so that really gifted and promising students need not normally have to go abroad for receiving postgraduate or research training. We consider that the development of a few of the most promising universities in India (including, we hope, one of the IITs and one agricultural university) to such a standard within the next ten years is definitely practicable and should be taken up as a matter of high priority.

11.20. Why do we make this proposal and regard it as crucial at this stage? There would be several advantages in creating such universities. In the first place, they would make their existence felt by their research and by the high standards of training which they would provide for their students. They would also supply a goodly portion of the outstanding personnel needed for the staffs of universities, colleges and other institutions of higher education. In this way, their graduates may be expected to infuse into them the standards acquired in their own universities and to spread the ethos of genuine intellectual activity and devotion into the institutions where they are employed. It is unfortunate that, at present there are hardly any such universities in the country which perform this vital and catalytic role in the Indian academic world.

11.21. One important advantage of these universities is that we would be able to provide, within the country itself, first-rate postgraduate education comparable to that in educationally advanced nations. The scholars and scientists trained in these universities will feel much more akin to their own centres of creativity. The importance assigned to foreign degrees whether they are of high or average or poor quality, will be considerably diminished and those who have not 'returned' from abroad would not feel at a disadvantage. We realize that it will still be necessary for Indian scientists and scholars to go abroad for purposes of further training, research or for consultation with their foreign colleagues. We have made certain proposals in the scheme of scholarships for this purpose. But instead of going abroad to receive first-rate postgraduate education[1], study abroad will primarily aim at bringing first class Indian scholars to work with distinguished scholars of international reputation.

11.22. This concept of providing first-rate postgraduate education to talented young persons within the country received strong support from Prof. F. Seitz, President of the U.S. Academy of Sciences, and Prof. P. M. S. Blackett (President of the Royal Society). It would be worthwhile to quote from the convocation address to the University of Leeds (England) delivered by Prof. Blackett in 1964. His remarks may or may not apply to some developing countries; they are certainly relevant to Indian conditions:

> There are three reasons why it seems to be exceedingly important that all developing countries should attempt as soon as possible to create facilities in the major subjects for first class higher degree work, so that normally a student takes his higher degree in his own country. First, the present widespread practice of sending most bright students overseas to take a higher degree makes it difficult to build up native research schools in the universities because an adequate supply of research students is the lifeblood of a creative university postgraduate department. Following this it will be difficult to keep good staff unless they have an adequate number of postgraduate students. Second, the loss of trained people to the developing countries, by overseas students not returning to their homeland after taking their higher degrees abroad, will be reduced. Third, it will save much foreign exchange. A three-year Ph.D. course will cost some £3,000, taking fees, maintenance and fares into consideration, and this is a direct drain on foreign exchange whether the money is provided by the State or privately.

11.23. In addition, these universities would help Indian academic life to come into its own. At present, the 'centre of gravity' of Indian academic life is largely *outside* India. That is to say, our scholars and scientists working in fields which are internationally cultivated still tend to look outside India for judgment of their work, for intellectual models of the problems which they study, for the books they read, and for their forum of appreciation and approval. This is damaging to our academic life in a number of ways. First, Indian problems are not seen in their concreteness and particularity and as a result, techniques and theories are not adapted to the Indian situation. Secondly, Indian academics suffer from a certain lack of self-esteem and lose the confidence and courage necessary to try out new ways of attacking intellectual problems. When these major universities, comparable to the best in any part of the world, have come into existence, we venture to hope that our scientists and scholars, instead of having to look to Oxford, Cambridge or Harvard or Moscow or Paris for inspiration, would be able to look to centres within our own country for similar stimulation and guidance. This would be a change of the greatest significance. Once the stimulus has become 'Indianzed', it could act much more continuously and be less dependent on costly and infrequent personal contacts. Also by becoming naturalized in the Indian environment, it will be directed more confidently towards problems to which our scientists and scholars could give themselves without feeling dislocated from their milieu.

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[1] According to the latest available information, 15,393 Indian students and trainees were studying in foreign countries on 1-1-64. Of these, 1,353 students were studying arts, 1,652 were studying science, 4,191 engineering and technology, and 1,402 medicine and veterinary science. The number in the USA was 7,153, in West Germany 4,000, in the U.K. 2,798, in Canada 418, in France 123 and in the USSR 76.

11.24. This should not be taken to imply that we wish to promote any intellectual isolation or chauvinism—that will be the road to intellectual anarchy and disaster. No country, however outstanding its scientific and scholarly accomplishments, can be entirely self-sufficient. But there is a great difference between participation in the world intellectual community simply from the periphery, as a reproducer or a marginal contributor to what has been discovered or invented elsewhere, and participating as an equal in a process of creating, giving and receiving. We should strive for the latter position.

11.25. A possible objection to these proposals may be that what is proposed here is not quite democratic, that it seeks to institute a system of elite education by favouring certain institutions and impoverishing others. We recognize that our approach does involve at this stage a certain differentiation between the universities. This is, however, not only inevitable in an economy of scarcity but is also the only sure and practicable way to benefit all ultimately in the shortest time possible. Moreover, we must recognize that pursuit of excellence implies and requires a discriminatory approach; and that to provide equal resources to all irrespective of the quality of their performance and potentiality for growth merely promotes mediocrity. We are trying to establish a democratic social order in our country and obviously a democracy cannot flourish unless it has at its disposal the services of a highly trained and powerfully motivated educated class. Unless a system can be devised which will produce such persons in much larger numbers than is being done at present, every aspect of the country's development will be prejudicially affected. In fact, we may go further and say that there is always need for elite institutions in every academic system. The upper stratum of American higher education was developed in the first quarter of the present century, largely by the Ph.Ds from Chicago, Harvard and Columbia. The development of British higher education in the first half of the present century was largely due to the fact that, until recently, the staff of the new universities in most subjects was supplied by the universities of Oxford and Cambridge which, by 1900, had taken their place as distinguished centres of scholarship and high standards of teaching.

11.26. **Implementation**. We must now examine how these major universities can be developed within the relatively short period of about a decade. The idea of establishing new universities for the purpose should be ruled out: it would involve a large and avoidable capital expenditure and delay the entire process of the improvement of higher education. The first step in the programme would, therefore, be for the UGC to select, as soon as possible, from amongst the existing universities, about six universities (including one of the IITs and one agricultural university) for development as major universities.

11.27. A university selected for such development will have to do several things. It must make an effort to recruit students sufficiently qualified and endowed mentally to benefit from the superior training to be given. It must get together as quickly as possible an intellectually distinguished group of teachers who will be able to provide the requisite training and make valuable research contributions. And it should make an effort to provide adequate facilities and satisfactory conditions of work. We shall examine these three essential conditions briefly.

11.28. **Recruitment of Students**. At present our students tend, by and large, to be recruited locally or on a State-wise basis and except for a few all-India institutions, *the small number of students of superior capacity are usually swamped by the large numbers of those who are not well prepared for intensive higher education.* In such a situation, many of the good students lose their motivation for intellectual work and neither fulfil their own potentialities nor stimulate one another adequately as they normally should in a good institution. They are not numerous and powerful enough to offset the downward drag of the uninterested or apathetic students, and instead of pulling the others upward, they themselves tend to become submerged in the mass. A major university of the kind we contemplate should have a 'critical mass' of students of outstanding capacity and promise. This is possible only if they are recruited on an all-India basis. We, therefore, recommend that a national scholarship scheme combined with a placement programme should be organized—the scholarships being tenable only at the major universities or at others where well developed centres of advanced study (to be discussed later) exist or in their approved constituent or affiliated colleges. The amount of these scholarships should cover all costs of university education e.g., tuition and other university fees, maintenance, and allowance for textbooks and a small allowance for personal expenses.

11.29. Each major university should be assigned a number of scholarships for the undergraduate stage which will provide it with enough talented students for its postgraduate classes. The actual number may be decided for each major university by the UGC from year to year, in view of all the factors involved. Of these scholarships, about half should be from outside the area of the university and half for students from inside its area. To avoid loss of time, a beginning may be made by making use of the existing examinations conducted by the universities and the State Boards of Secondary Education supplemented by other data as recommended elsewhere. As far as possible, students should be selected from all the States and Union Territories. Each university may, if it considers it necessary, administer a special test for the purpose or all the major universities may jointly organize a national test as the IITs are doing at present. The scholarships must be continued at the postgraduate level where smaller numbers are involved but the difficult problem of adjusting the standards of different universities has to be tackled.

11.30. **Recruitment of Staff.** In building up a major university, it will be necessary to conduct an energetic search throughout the country for outstanding and promising young persons for its teaching and research staff. We recommend that each department or faculty should have a specially appointed personnel advisory committee, which would work in close collaboration with the appointing authorities of the university, to find faculty members in fields in which it is already distinguished or in which it seeks distinction. It should have, as a major responsibility, the search for the most outstanding and promising Ph.Ds, M.As. and M.Sc's. and even brilliant recent graduates. The great merit of such committees lies in their informality and freedom from rigid procedures and this should be fully ensured. They should scrutinize the lists of Indians abroad and the candidates available within the country and the search for staff, instead of being limited to the State or the region, should be made nation-wide and, in a sense, world-wide. They should actively seek such candidates for appointments and wherever necessary, offer them advance increments. What is even more important, they should be assured of research opportunities, opportunities for study leave and the possibility of achieving professional excellence. There should be room for flexibility in the appointments and promotions. The UGC should place at the disposal of each university a contingency fund which may be used to provide more attractive salaries to persons of exceptional promise and performance. However, the tendency to use it simply to reward or promote persons who have passed the peak of their creative powers should be strongly resisted. Moreover, it should be open to a university, on the advice of the Head, to reduce the number of posts for lecturers or readers and to use the money so saved to appoint additional professors where this is justified. Care should also be taken not to appoint men on an emergency basis. For instance, the appointing authorities should never say: 'This post *has* to be filled; and, we hope, this person will be good enough'. It is better to leave a post unfilled or to make some temporary arrangements than to fill it with a person whose main qualification is availability. It is only 'inspired men—found, rewarded and planted firmly in the classroom—who can and undoubtedly will give.........our (universities and) colleges a new lustre, built on the mysterious moments when mind confronts mind and a student suddenly senses the power and richness of his own intellect.'[1]

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[1] Times Educational Supplement.

11.31. **Centres of Advanced Study.** Partly as a preparation and partly as a consequence of the establishment of these major universities, it is necessary to strengthen and expand the UGC programme of the establishment of centres of advanced study. One way of doing this will be to establish 'clusters' of advanced centres in some of the universities as has been done, for instance in Delhi University. They will add strength to, and enrich, one another and be specially helpful in promoting inter-disciplinary research. In other cases, a cluster of centres may not be possible and we may have to begin with a single centre. While these centres will be mainly concerned with postgraduate teaching and research, every care should be taken to see that they do not become isolated from the rest of the university and do not develop a kind of academic snobbishness towards other departments or undergraduate teaching. In fact, they are essentially meant to help in raising the standard of the departments and the university as a whole. We would recommend the establishment of about fifty such centres, including some in modern Indian languages over the next five to ten years. At least one of them should concentrate on developing an inter-disciplinary approach to education. The other areas which are not covered in the scheme at present are agriculture, engineering, medicine and modern Indian languages. We recommend that the scheme should be extended to these also.

11.32. **Provision of Facilities.** We need hardly emphasize that it will be necessary to provide adequate facilities and satisfactory conditions of work for this critical mass of gifted students and teachers assembled in the major universities. The programme need not necessarily be very costly, especially if the emphasis is on austerity and utility rather than on ostentation and luxury. In fact, we look forward to the major universities giving a lead in reducing expenditure on buildings and equipment.

11.33. **Some General Suggestions.** We would like to make the following suggestions regarding the selection, periodical review and management of the centres of advanced study:

(1) The administration of a centre, subject to the overall supervision of the university's Executive Council, should be the responsibility of its director assisted by a small but representative committee of his colleagues. This should consist of all the professors in the department and a number of readers and lecturers elected by the staff. We suggest that it might meet at least three times a year to discuss the academic programme of the department and related matters, its proceedings being circulated to the faculty of the Academic Council. In fact, the setting up of such departmental committees would be useful in all departments, whether it has a centre of advanced study or not.

(2) A centre once established should not be taken to mean that it will continue to be there irrespective of its work and performance. The privilege of being a centre of advanced study must, as it were, be continually earned and deserved.

(3) The original selection of a university department as a centre should be made on the basis of the quality and extent of work already done by it, its reputation for good teaching, its contribution to research and its potentiality for further development. The process of selection should be so devised that it will win the confidence of the universities and the academic community generally.

(4) Each centre of advanced study should have, say, once in three to five years, a visiting committee, consisting of outstanding Indian and, where possible and necessary, foreign experts who will conduct a review and appraisal of the accomplishments of the centre. These visiting committees should not include members of the centre under review and they must not hesitate to be outspokenly critical where such criticism is called for. Above all, they must concentrate on offering positive suggestions for the improvement of teaching and research within the centre.

11.34. **Extension of Excellence to other Departments.** Steps should be taken to ensure that the standards of the centres of advanced study, whether in the major or other universities, are extended, as early as possible, to other departments and to affiliated colleges. For this purpose, we make the following suggestions:

(1) The centres within a university should function in close collaboration with other centres and departments which are not centres of advanced study and measures should be adopted to involve the entire staff of the university in functioning as an intellectually effective community.

(2) The major universities should constantly strive to enlarge the area of their excellence. For this purpose, they might be given a grant in proportion to the number of centres they already possess, to be used for the purpose of raising other departments within the university to their level. Such grants, given in the first instance, for five years for what we might call 'aspirant centres' should be used for the recruitment of adequate staff and the acquisition of equipment and books. They may be renewed for a second five year period if the progress is satisfactory.

(3) Centres for advanced study should seek to bring the relevant teachers of their affiliated colleges into closer contact with their work. We suggest that the better qualified and more interested teachers of the affiliated colleges should be encouraged to attend staff and postgraduate seminars of the centre.[1] Opportunities for research within the framework of the centre should be provided for college teachers if they are judged to be qualified for the purpose and their research schemes are approved. They should have the privilege of using the facilities of the centre to supplement the resources of their colleges. Study leave should be permitted for this purpose and, where the college cannot afford to pay the teacher's salary, the expenditure may be met out of the funds of the Centre. It should also be possible to make available, to the major universities, specially earmarked grants for the upgrading of their colleges out of the funds allocated by the UGC for the improvement of colleges. If, in spite of all the guidance and assistance provided, the colleges fail to improve and to produce the desired results, the universities should seriously consider the possibility of using their powers to disaffiliate them.

11.35. **Financial Support.** It is obvious that the development of these major universities, as indicated above, will require considerable investment of funds in capital expenditure and the running costs will also be heavy. It is essential that the expenditure required for their development—both capital and recurring—should be placed at the disposal of the UGC by the Central Government.

IMPROVEMENT OF OTHER UNIVERSITIES AND AFFILIATED COLLEGES

11.36. Side by side with the development of these major universities and centres of advanced study, measures must also be adopted to ensure that the excellence generated in them is gradually extended to other universities and affiliated colleges so that standards in the entire system of higher education are upgraded in due course. It is to the discussion of this second part of the programme for the improvement of higher education that we now turn.

11.37. **Supply of Teachers for Higher Education**. One of the important contributions which the major universities can make to the development of the other universities and affiliated colleges, as pointed out earlier, is to provide them with teachers of quality. Steps have to be taken to ensure this and for this purpose, we make the following proposals:

(1) Every effort should be made to induce talented students from the universities to join the teaching profession and to place a majority of them in universities and colleges, other than their own, so that they can help to raise standards. The UGC should maintain a central clearing-house agency for the purpose and supply the data about these young scholars to universities and colleges and supply them with information about available jobs.

(2) With a view to facilitating the recruitment of outstanding persons to the teaching profession, the

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[1] This privilege should also be extended to postgraduate and advanced third-year undergraduate students of these affiliated colleges.

UGC should sponsor a scheme for instituting a number of fellowships for the purpose. The fellowships should be at three levels--lecturers, readers and professors. Outstanding persons, who may otherwise be lost to the profession, should be granted these fellowships and seconded to work in suitable departments of universities, care being taken to see that they are appointed against permanent posts as early as possible.

(3) The universities and affiliated colleges should be encouraged, so far as possible, to pre-select their new teachers and attach them to the major universities for about a year during which period they will come into contact with some outstanding teachers in their own and allied fields, will receive orientation towards their chosen profession and perhaps study schemes and techniques of research adopted there.

In course of time, as the graduates of the major universities and centres of advanced study find appointments in the other universities and colleges, they will carry over their traditions of work and scholarship to their colleges and it is likely that they will be more actively receptive to the new ideas emanating from their universities and more disposed to enter into an intellectual dialogue with them. The influence of the major universities will thus pass into other sectors of higher education and help in raising standards.

11.38. This process of extending the standards of the major universities should be fostered by the UGC by adopting, amongst others, the following devices:

(1) Strong inter-university links should be formed among members of the centres of advanced study, members of aspirant centres, leading university departments and outstanding affiliated colleges, in particular fields of research. For this purpose, small two to three-day conferences at which a few papers are presented and a critical and constructive discussion forms the main part of the agenda, should be encouraged on a fairly large scale. The funds required for the purpose should be included in the grants to the centres.

(2) Invitations may be given to promising scholars and scientists from other universities or affiliated colleges to do research and to conduct seminars (say for a term or a session) at one of the centres of advanced study. It would contribute to their intellectual refreshment and give an incentive to the staff of the other universities and colleges to strive to win the distinction and the advantages of such an invitation.

11.39. **Development of Other Universities.** The universities, which are not major universities, should also strive to develop high standards, to begin with, at least in one or two departments, by due concentration of resources and by securing competent teachers. If they do so, the UGC should give them special grants on the basis of merit. When a university department is thus raised to a high level, its further elevation to the status of an aspirant centre may be considered; and, if it satisfies the conditions laid down, it may be assisted financially for a period of five years in the first instance. If its progress is satisfactory, the department could be developed, in due course, into a full-fledged centre of advanced study. We hope that once this process starts, it will be possible to raise quite a number of the universities to a reasonably high standard by the end of the century.

11.40. **Development of Affiliated Colleges.** We have to recognize that the standard of the first degree and other post-graduate work in the bulk of affiliated colleges cannot be, in general, the same as that of the education imparted in university departments. The latter will usually have a more balanced combination of teaching and research than in a college, better staff, better qualified students and better resources.

11.41. At the same time, there are several colleges of long standing which have done and are doing as good work as any good university and it should be an objective of educational policy to encourage them. The major universities should specially help them in every possible way. They will get many of their teachers from them and will be inevitably drawn in a healthy competition for raising standards. To assist in this process, we make the following recommendations:

(1) Affiliated colleges should be classified in terms of the level of their performance.

For instance, the criteria for this purpose may, amongst others, include:

- — number and quality of staff;
- — number and general quality of students;
- — research output;
- — library facilities;
- — laboratory facilities for science students;
- — quality of student discipline;
- — performance of graduates of the college in national scholarships examinations;
- — innovations in teaching procedures; and
- — examination results.

The techniques of applying the above criteria in practice must be worked out and the institutional machinery for the quinquennial reviews of colleges on this basis must also be adequately provided. This classification should be used to provide special 'merit' grants to deserving colleges. For example, colleges which rank high on the list and continue to improve their programmes and teaching should be given certain advantages such as salary bonuses for their teachers, grants for libraries, laboratories and necessary amenities for staff and students, etc., or colleges which have maintained a good and effective library system for a period of, say, five years could be given matching grants to improve their libraries further. Similarly, colleges which, while maintaining other academic standards, have avoided serious breaches of discipline, might be given outright or matching grants for improved staff and student amenities, and so on. We are aware that such a system of college classification and grant-in-aid is beset with administrative difficulties. We, therefore, recommend that the UGC, in consultation with the universities and State Governments, should examine this question of classification of colleges in terms of level of achievement and make use of it in the allocation of grants to colleges under the fourth five year plan.

(2) Finally, we should like to refer to the question of 'autonomous' colleges which has been under discussion for many years. Where there is an outstanding college (or a small cluster of very good colleges) within a large university which has shown the capacity to improve itself markedly, consideration should be given to granting it an autonomous status. This would involve the power to frame its own rules of admissions, to prescribe its courses of study, to conduct examinations and so on. The parent university's role will be one of general supervision and the actual conferment of the degree. The privilege cannot be conferred once and for all—it will have to be continually earned and deserved—and it should be open to the university, after careful scrutiny of the position, to revoke the autonomous status if the college at any stage begins to deteriorate in its standards. We recommend that provision for the recognition of such autonomous colleges be made in the constitution of the universities. It should be possible, in our opinion, by the end of the fourth five year plan, to bring at least fifty of the best colleges under this category.

IMPROVEMENT OF TEACHING AND EVALUATION

11.42. **Improvement of Teaching.** One of the most important reforms needed in higher education is to improve teaching and evaluation. The existing conditions in this regard are extremely unhappy. Most of the teaching, till comparatively recently, has been dominated by a syllabus which is many years out-of-date. In fact the position in many universities remains unchanged still. As the performance of students is assessed by a single external examination based on the syllabus, an undue emphasis is placed on unintelligent and selective cramming. The situation is further aggravated by rigid rules which govern the selection of courses, by the inordinate amount of time that both students and teachers spend in formal classroom contacts, with the resulting lack of opportunity for independent study by the students and of adequate time for lecture-preparation by the teachers. If university teaching is to be vitalised, changes are needed on the following lines[1]:

- —more flexibility in the courses offered and more freedom of choice by the students;
- —a marked reduction in the amount of formal instruction and a corresponding increase in tutorial work, discussion groups, seminars and in independent study; and
- —a change in the character of teaching to discourage cramming drastically and to stimulate curiosity,

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[1] The need to orientate university teachers to ew and better methods of teaching has already been dealt with in Chapter IV.

problem-solving ability and originality.

11.43. The problem of introducing greater flexibility in the courses will be discussed in the next chapter. With regard to the formal lectures, we suggest that, in the universities and the colleges, the number of formal classroom and laboratory hours should be somewhat reduced. The time thus saved should be devoted to independent study, under the guidance of instructors, to assigned reading, writing of essays, solving of scientific and mathematical problems, and small research projects in which the student seeks out and learns to use independently the books and documents he needs. Every effort should be made to challenge and stretch the minds of the students by assigning them more exacting reading assignments, asking them to solve more difficult problems and providing opportunities for independent study of subjects in which they become especially interested. In addition, the students should be encouraged to do much more general reading than they do at present, both during the academic year and in vacation periods. This highlights the importance of building up good libraries, both in universities and in colleges.

11.44. **Development of Libraries.** With ever increasing enrolment in universities and colleges, the demand for library service has been constantly growing. Unlike the past, the library staff have now to cater to the diverse needs of undergraduates, postgraduates and research scholars. It should be realized that modern university libraries are also required to serve a larger number of academic departments and to perform new functions like indexing and abstracting. Moreover, the present position of expenditure on books and periodicals is not satisfactory. It is only in four universities that expenditure on books and periodicals is more than 5 per cent of the total expenditure as shown below:

Percentage of total expenditure	No. of universities[1]
Less than 1 per cent	5
1 to 5 ,, ...	34
5 per cent and above	4

11.45. In this connection, we make the following recommendations:

(1) The Heads of Departments and library staff should co-operate fully in drawing up an integrated plan of library development, from a long-range point of view. Such a plan should take into consideration a number of factors such as the anticipated increase in enrolment, the faculty-wise distribution of students, new subjects and fields of specialisation, special research projects and so on.

(2) No new university, college or department should be set up without taking into account its library needs in terms of staff, books, journals, space, etc. Nothing could be more damaging to a growing department than to neglect its library or to give it a low priority. On the contrary, the library should be an important centre of attraction on the college or university campus.

(3) The utilization of library grants should be suitably phased over a plan period. In other words, there should be a regular programme of strengthening of academic departments and the library, instead of haphazardly overfeeding them in one year and starving them in the next.

(4) An essential thing about the development plan of a university library is to lay down physical rather than financial targets. Even more important is a proper use of books by students and teachers. Lectures should be supplemented by tutorial instruction, and thereafter the students should turn to the library to find for themselves, with the help of reference librarians, the relevant material and knowledge needed. More working hours and working days, easy accessibility to books, adequate provision in terms of staff, multiple copies of textbooks which may be loaned to needy students, better display of new reading material, organization of book-clubs, separate rooms for periodicals, reference books and research works, are some of the measures that would help raise the standard of library service. The reading habit, which is appallingly low, must be toned up in every possible way.

(5) In addition to having 'departmental' and 'seminar' libraries stocked with a 'working collection of books and journals' the central library should facilitate interdisciplinary communication as also the work of research scholars in borderline disciplines. This will also be economical in the long run.

(6) With the emergence of active research in our universities, there is a need for

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[1] Information available for 43 universities.

conservation of research potential through documentation work and service. It is, therefore, necessary to appoint a team of documentalists in university libraries who can speak the language of research workers and undertake the work of documentation-search, indexing and abstracting. For this purpose, it will be advisable to set up a few regional centres with equipment for photographic reproduction of documents such as microfilming and photostating.

(7) We should completely break away from the traditional view that a library is a conventional but more or less useless accessory. No definite set of standards can be used in developing a university library programme but the essentials relate to competent staff, an adequate collection of carefully selected and well-organized books, well-planned physical facilities and professors-teachers who teach with books.

(8) A collection of books, even a collection of good books, does not constitute a 'library'. Given enthusiastic teachers 'who teach with books', and librarians who can cooperate with them in converting the library into an intellectual workshop, even a comparatively small collection of sensitively chosen books may work wonders in the life of students. Without such a staff, the most luxurious building or extensive book collection, may have no effect at all. The object of library planning is not to build a collection of books unrelated to class-work, laboratory research and conference room. The object is rather to relate book selection, organization of the books, conditions of access and all library activities to the daily needs and activities of the academic community, both professors and students. The book selection should be oriented toward supporting instruction and research. The teaching and library staff should determine the titles and copies of books to be purchased and periodically work together to discard obsolete books. Many of these can be replaced with microfilms and micro-cards.

(9) The library should

- — provide resources necessary for research in fields of special interest to the university;
- — aid the university teacher in keeping abreast of development in his field;
- — provide library facilities and services necessary for the success of all formal programmes of instruction;
- — open the door to the wide world of books that lie beyond the borders of one's own field of specialisation; and
- —to bring books, students and scholars together under conditions which encourage reading for pleasure, self-discovery, personal growth and the sharpening of intellectual curiosity.

(10) There is no formula for estimating with precision how much money a university should invest in its libraries[1]. It has been found that the expenditure on library in relation to total educational expenditure of the university, has gone up from 1·88 per cent in 1951-52 to 4·04 per cent in 1960-61, by which time the grants provided by the UGC had begun to make an impact. The University Education Commission had suggested about 6·5 per cent of educational budget as reasonable expenditure on libraries. But this could vary say from 6·5 per cent to 10 per cent depending on the stage of development of each university library. It may also be suggested that, as a norm, a university should spend each year about Rs. 25 for each student registered and Rs. 300 per teacher.

(11) The foreign exchange needed for university and college libraries should be allocated separately to the UGC.

11.46. It is most important to emphasize original thinking in the study of all subjects and to discourage memorizing. The rate of growth of knowledge is now so great that only a few of the so-called facts which one learns in the university are liable to be useful, or even true, a few years later. This is specially true of the sciences. Till comparatively recently, it was possible for a teacher to provide his students with a map, as it were, which would guide them through life. Now, the best thing he can do is to give them a compass. The function of a modern university is to give that enduring knowledge of the fundamental principles of a subject which would help them to solve new problems as they arise and to keep on learning throughout life. This should be regarded as the distinguishing mark of a 'university mind'.

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[1] The total annual world book production during the years 1960 to 1963 was of the order of 360.000 375,000. 385.000, and 400,000 titles respectively. In 1966 it is expected to reach 450 000 titles. Of these about 18 per cent are in the English language only. This would mean about 80.000 titles covering all branches of learning are produced annually. Even if we were to import 15 per cent of the total titles for use by our universities and colleges, it would mean 12.000 titles to be imported. At an average cost of Rs. 20 per title and 250 multiple copies, the estimated expenditure would come to Rs. 48 million and providing Rs. 2 million for books in all other languages, the expenditure on imported books alone would need Rs. 50 million anually.

11.47. There is a practice to assign the youngest, least experienced staff members to teach undergraduate classes. Some of them have neither the stature nor the experience nor the poise to win young men and women effectively to the pursuit of knowledge. In a way, effective teaching at this level demands the attention and co-operation of the best teachers available. This does not, of course, mean that there is a possibility of all or many senior and experienced teachers being given undergraduate work. But it does mean that there should be a possibility of undergraduates coming into occasional contact with such teachers, particularly when a new subject has to be introduced for the first time.

11.48. We would like to make the following suggestions for improvement of teaching:

(1) A class hour at the university stage should not be less than 60 minutes. A part of the time, say 10 minutes, should be devoted to answering questions by students and assigning them home work. The content and quality of lectures in general needs to be considerably improved. One way of characterizing the level of class work is that every one hour of instruction should receive about 3-4 hours of study time to digest the lectures.

(2) In several cases, teachers are away, for long periods, from their institutions during term time. This interferes with the smooth working of the institutions and is detrimental to good teaching. It may be laid down as a rule that no teacher should be away from his institution during 'term time' for more than seven days in a year. There should also be a convention that during 'term time' teachers should not take up assignments which interfere with their teaching duties.

(3) All new appointments should be made during summer time so that teachers join their new posts at the beginning of the academic year. Further, unless there be compelling reasons, no teacher should be permitted to leave an institution to take up another appointment during term time.

11.49. We realize that it would be impossible to bring these changes in all the institutions at the same time. They would become possible as better teachers and facilities become available. Most of them are relatively easy to introduce in the universities and their constituent colleges, but more difficult in the affiliated colleges, especially in the small colleges in the rural areas But this is definitely the direction in which we should move.

11.50. **Experimentation.** We should like to draw attention pointedly to the need for experimentation, which we have stressed in other spheres of education also. There is immense scope for it in our educational system but unfortunately there is little deliberate and sustained effort in this direction. It is necessary both to create the desire and the will for it and to provide the financial and academic means to do so. There are two important areas in which such experimentation would yield particularly rich dividends.

(1) One such area concerns the manner of handling larger numbers of students without a proportionate increase in educational expenditure or the number of faculty members. It is by no means clear that a small-sized student body necessarily leads to an improvement in standards or that there is some magically correct student-teacher ratio. Some subjects can be taught as well in large classes as in small ones. There is evidence to show that classes of intermediate size, say 40 to 80, have little or no advantage over classes of several hundred students. The use of microphones and tape records of lectures by distinguished professors from all over India could be usefully tried for this purpose. Many leaders in higher education have come to the view that part of college teaching should be done in large classes and part in small groups of 5 to 20 students, with at least half of the students' time being spent on assigned reading, problem solving, and other kinds of independent study. We should also remember that the students usually learn almost as much from each other as from the faculty.

(2) Another desirable experiment would be to have a certain amount of the teaching at the undergraduate stage done by the post-graduate students after their first year. This would have three advantages: the student-teachers would gain valuable experience in teaching, and their ability as teachers could be judged before they are appointed to college or university faculties;

the number of teachers at the college level could be increased or alternatively, part of the time of lecturers and readers could be freed for research. It would also be possible to pay postgraduate and research students for teaching tasks and this would help some needy and able students to continue their education.

11.51. **Teaching Methods.** The problem of teaching methods in higher education has been a relatively neglected subject in India so far. We recommend that it may be examined by the UGC through a special committee appointed for the purpose. We also recommend that the schools of education[1], whose establishment we have proposed, should make a special study of the teaching methods, not only at the school stage, but also in the universities and affiliated colleges. Such studies will be of great use in organizing the orientation courses for junior lecturers which we have recommended.

11.52. **Examination Reform.** In the present system, when the future of the students is totally decided by one external examination at the end of the year, they pay minimum attention to the teachers, do little independent study throughout most of the academic year and cram desperately for the final examination. The crippling effect of external examinations on the quality of work in higher education is so great that examination reform has become crucial to all progress and has to go hand in hand with the improvements in teaching. The UGC rightly emphasized the significance of the problem and said: 'We are convinced that if we are to suggest any single reform in university education, it should be that of examinations'. One of the earliest efforts of the UGC was concerned with the study of the problem and the report of its expert committee on examination reform is a useful document. But it has not been implemented to any appreciable extent so far. This is one of those areas in education about which one can say that the problem is known, its significance is realized, the broad lines of the solution—at least to begin with—are known; but for some reason or other, an effort to implement it on any worthwhile scale or in a meaningful manner has not yet been made. What is needed is vigorous and sustained action.

11.53. We make below a few recommendations that might make a welcome break-through in the situation. One line of attack would be to abolish set syllabuses and the external examinations based on them altogether and to replace them by a system of internal and continuous evaluation by the teachers themselves. This is already being done in some institutions like the IITs or the agricultural universities and it could be increasingly extended to others as soon as the necessary facilities and conditions can be provided. We hope that, at no distant date, it will be adopted by all teaching universities and that the major universities would give a lead in this matter.

11.54. We realize, however, that external examinations will remain with us for a long time, especially in universities which have large numbers of affiliated colleges of very unequal standards. The main strategy here would be to attack the problem on two fronts: introduction of more frequent, periodical assessment so that the undue emphasis on the final examination as the sole determinant of success is reduced; and reform of evaluation techniques. With regard to the first, a good deal can be gained if the performance of the student is assessed throughout the session in a suitable manner and if periodical tests are held in the middle and at the end of each term. A system of internal assessment should be introduced as a supplement to the external examination, based on such periodical evaluations. The results of these internal assessments should not be mechanically added to the external marks but kept separate and both should be shown side by side in the final certificate. Passes should be required separately in both and the divisions gained in them should be declared separately. Every year, a careful review should be made of the correlation between internal and external assessment separately for each institution. This should be taken as a point for classification of colleges and also related to grant-in-aid so that institutions which tend to overassess their students persistently would stand to lose in status and finance. The regulations may also authorise the university to withdraw affiliation for persistent irresponsible assessment.

11.55. Regarding improvement in examination techniques, we have little to add to the learned literature already available on the subject[2]. As we said earlier, what is lacking is not knowledge, but will, courage and perseverance to work out its implementation. We suggest the following measures:

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[1] Chapter IV.

[2] Aspecial paper on the subject prepared for us by Dr. H. J. Taylor is given in Supplementary Volume I, Part V. We broadly agree with the recommendations made therein.

(1) There is need for a central source to guide and activate a movement of examination reform, without which no early and effective progress is possible. For instance, the activity that one now sees in this matter in the State Boards for Secondary Education is due largely to the Central Examination Reform Unit in the National Council of Educational Research and Training. We recommend that the UGC should set up immediately a similar examination reform unit for higher education at a sufficiently high level which would work in collaboration with the universities. This could become the starting point of an effective programme of reform.

(2) The next step should be to persuade some universities to launch upon the programme in a big way. In addition to major universities which will have to give a lead by abolishing the external examinations altogether, the other universities should set up special units for examination reform and should prepare and implement a programme of reform in consultation with the central unit.

(3) Another important point of emphasis would be the reorientation of university teachers to adopt new and improved techniques of evaluation. A programme of seminars, discussions or workshops should be organized to serve as the spearhead of the reform. This will have to be continued from year to year to evaluate results, to try out experiments and to make further plans. This would be the responsibility of the central and local examination reform units.

We trust that, if a few universities can make a determined attack on the problem and achieve a break-through, the whole programme of examination reform will be greatly accelerated.

11.56. We recommend that the grading or classification of examination results is almost invariably done on an absolute rather than on a relative basis. In our present system of examinations, an 80 per cent mark, say, in mathematics, does not convey the same meaning as, say, 80 per cent mark in history or English. Again an 80 per cent mark in one year does not mean the same thing as 80 per cent mark in another year because examiners may be different, and there may be many other variations from year to year. A system of grading must be such as to bring out whether a student belongs, say, to the top 20 per cent of his class or to the bottom 20 per cent. It is strongly recommended that even if the present system of examinations and classifying the results is continued, it should be supplemented by giving, in the same certificate, the relative grading of the student, say on a five point scale. Grade 'A' would mean that the student is in the top 20 per cent of those who have been successful at the examination.

11.57. We recommend that early measures should be taken to abolish payment of remuneration to examiners. Evaluation is a part of teaching and teachers should be willing to undertake it as part of their duties. This is one of the reasons why we have recommended an increase in the salary scales of teachers. However, we recognize that the load of this work should not be too heavy on any teacher and would, therefore, suggest that the maximum number of scripts to be examined by a teacher in a year should not exceed 500.

11.58. **The Medium of Education.** The problem of teaching and evaluation in higher education is inextricably linked with the medium of education and examination. It was pointed out earlier[1] that, as a part of the development of education in our country, we have to move energetically in the direction of adopting the regional languages as media of education at the university stage, that careful preparation should be made for the purpose, that both the manner and the time of transition would have to be left for decision to the university system. We shall now deal with some other aspects of the problem from the point of view of practical implementation:

(1) We would like to emphasize that the medium of classroom communication and examination should generally be the same. The present arrangement under which a large proportion of students, at the first degree stage and even later, use the regional language for purposes of examinations although the classroom instruction is given through the medium of English, is educationally unsatisfactory. If the student can be expected to express himself in the regional language in his examination, it should not normally be difficult for a teacher to do the same in the classroom. In fact, the student's understanding of the fundamental

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[1] Chapter I.

problems and issues would be better and his performance in the examination would improve if, in all cases where the universities have taken a decision to adopt the regional languages as media of examinations, they also decide to adopt them as normal media of classroom communication. However, it must be remembered that the hold of English as a medium in the universities is linked with the use of the regional languages as the languages of administration in the States. So long as the prize posts in administration go to students who have good command over English, it will not be purprisings if a substantial proportion of students continue to prefer education given through it.

(2) While the goal is to adopt the regional languages as media of education, we should like to stress again that this does not involve elimination of English. In fact, English, as an important 'library language' would play a vital role in higher education. No student should be considered as qualified for a degree, in particular, a Master's degree, unless he has acquired a reasonable proficiency in English (or in some other library language). The implications of this are two-fold: all teachers in higher education should be essentially bilingual in the sense that they would be able to teach in the regional language and in English, and all students (and, particularly postgraduate students) should be able to follow lectures and use reading materials in the regional language, as well as in English.

(3) Great care has to be taken to ensure that the progress of the student entering the university is hampered as little as possible by complexities relating to the media of education. In a student's life, the change from school to college is a crucial stage. On entering college, he finds that there is a greater demand on his powers of understanding and concentration than at school. When to this is added the difficulty inherent in a sudden change in the medium of education, it is not to be wondered at that many students feel bewildered and lost and lose zest in their studies. At the earlier stage of the undergraduate course, it will be an advantage if the bulk of the class-work is done through the regional language. As one goes higher up the educational ladder and as the student's command over English and his familiarity with its use as a medium of education increases, more and more of the class-work could be in English. At the postgraduate stage, at least for some time to come, the bulk of the class-work will have to be in English.

(4) To safeguard the interest of minorities, some special steps would be needed. The maintenance of colleges teaching through the medium of Hindi in the non-Hindi speaking areas or of Urdu (which is not a regional language in the sense the other modern Indian languages are) in any part of the country should not only be permitted but encouraged. In so far as colleges teaching through the media of modern Indian languages other than the regional language of the area are concerned, there need be no obligation on the State to provide such institutions, except in cases where an adequate number of students is available. But if any linguistic minority group offers to maintain such an institution, it should be permitted and admissible grants given to it.

(5) As we have recommended earlier, it would be desirable to establish centres of advanced study for the development of modern Indian languages so as to make them fit media for higher education. These should include two centres for Urdu—one in the North and one in the South.

11.59. We are definitely of the view that at the university stage, no language should be made a compulsory subject of study but the classical and modern languages of India and important foreign languages should be provided as elective subjects. As we have recommended elsewhere, there should be considerable flexibility with regard to the choice of the subjects. The compulsory study of a language is likely to make some useful combination of subjects impracticable by placing too heavy a burden on the students. We were concerned to find that in one big university, about 50 per cent of the total time available for education at the under graduate stage was devoted to the study of languages only. It is obvious that under such conditions, the studies of the principal subjects greatly suffer and standards remain loy.

11.60 Since an adequate command over a library language is indispensable for a university student, we recommend that adequate facilities should be provided in universities and colleges for the study of English and where necessary or possible, for other library languages also.

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[1] Chapter XII.

For this purpose, we recommend the following:

(1) Special units for teaching English should be established in university and colleges whose main objective would be to give a good working knowledge of English to new entrants by the adoption of modern teaching techniques and in as short a time as possible. A distinction has to be made between the teaching of English as a skill and the teaching of English literature. The teachers in this unit will, therefore, need special training on the lines of the pioneer work being done at the Central Institute of English at Hyderabad. Moreover, it has to be noted that the students who enter the universities will be at different levels of attainment in English. Some will have come from English-medium schools and be well advanced. Others who come from urban schools with, comparatively speaking, good facilities for teaching English would be at an average level. But a large number who would have come from rural areas or the weaker schools will be at a much lower level of attainment. No single course in English would meet the needs of all these students. It should, therefore, be a responsibility of the English units to adjust their teaching to the needs of the different categories of students and to ensure that they are all given at least that essential command over the language which will enable them to use it efficiently as a library language. While the facilities should be provided in all institutions so far as possible, it should be optional for each student to decide the course he would take to meet his needs or even take no course at all, if his preparation at school stage is found to be adequate.

(2) It would be an advantage to teach some English as a part of the elective subject course in the first year of the under graduate stage. For example, students of economics may study English for about two periods a week as a part of their course in the first year. The object of this teaching would be to introduce the students to literature in economics in English, to the special vocabulary used in the subject and to help them to read with comprehension books and journals in English in their special field. Where such courses have been tried, they have proved quite helpful and have enabled the student to use English as a library language in his own field far more efficiently than a general English course would do.

(3) While English is our most important library language, it is necessary, as we have repeatedly stressed in this report, to develop other important library languages also. Much greater attention should, therefore, be given to the teaching of library languages other than English than is the case at present. In particular, we stress the immediate need to study Russian on a larger scale.

11.61. In major universities, it will be necessary, as a rule, to adopt English as the medium of education because their students and teachers will be drawn on an all-India basis. This is the only feasible approach if their all-India character is to be maintained. But we are not opposed to the possibility of some university, which has the necessary quality of staff and students, trying this experiment in a regional language. We realise that this will involve some difficulties in drawing their students and teachers on an all-Inda basis; but we are convinced that they can be overcome. The position can be reviewed in due course as the linguistic situation develops.

STUDENT SERVICES

11.62. A major weakness of the existing system of education is the failure to provide adequately for student welfare. This is an aspect of higher education which needs to be improved on a priority basis.

11.63. Student services are not merely a welfare activity but constitute an integral part of education. The following are some of the important services which can be included in this programme:

— orientation for new students;

— health services;

— residential facilities;

— guidance and counselling including vocational placement;

— student activities; and

— financial aid.

Financial aid in the form of scholarships, book-banks and textbook loans and the provision for students to earn while they learn have been discussed elsewhere in the Report.[1] In this chapter, it is proposed to discuss briefly the other forms of student services.

11.64. **Orientation for New Students.** Entry into a college or a university is a very important change in the life of a student; and in some cases, the change is so great and sudden that he is apt to lose his balance. Some deliberate steps have therefore to be taken to facilitate adjustment. We recommend that all institutions of higher education should organize orientation programmes for their new students in the beginning of the academic year. Senior students should be actively associated with this programme. Group discussions and individual conferences can be arranged for the purpose and, where necessary, guided campus tours will also be helpful. No student should be left in doubt about the arrangements for housing and food, days and hours when his classes meet, the fees to be paid and above all the general traditions of the institutions and the rules and regulations he is expected to observe. Each student should also be assigned to an academic adviser, who should be a member of the staff and assist him in planning and formulating his total college programmes and organizing his studies to the best advantage. Every member of the teaching faculty should be expected to serve as an academic adviser to a group of students.

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[1] Chapter VI.

11.65. **Health Services.** Health services for students are generally neglected. The replies to the questionnaire sent by the Education Commission to the different universities on the subject have revealed that few of them have conducted any health surveys of their students and not many have organized systematic programmes of health services for them. In a number of universities, there is no medical examination, even at the first entry stage, and where medical examinations have been conducted, they are often of a perfunctory character without any suitable follow-up work. Society has a special stake in the health and the physical well-being of university students who are (or should be!) the elect of the rising generation and in whom it has to invest large resources and to whom it looks for the advancement of national interests. The organization of student health services at the university stage, therefore, should receive a high priority.

11.66. We recommend that early steps should be taken to organize adequate health services in universities and colleges. Health centres should be established on every university campus and in townships with a large student population to provide for medical examination, follow-up treatment, and emergency care. The services of part-time doctors should be enlisted for the purpose in smaller mofussil towns. We also recommend that adequate provision should be made for health education of students and for securing their involvement in the organization of health services—both in policy making and in the execution of programmes. The UGC may explore the possibility of organizing health services for university teachers and students on the lines of the contributory health service organized for the employees of the Government of India. A beginning may be made with one or two universities with a large resident student population and, in the light of the experience gained, the programme may be extended to other centres.

11.67. **Hostels and Day-Study Centres.** At present, hostel facilities have been provided for about 18 per cent of the enrolment at the university stage. There is need to expand these considerably and we suggest that an effort should be made to provide hostel accommodation for about 25 per cent of the enrolment at the undergraduate stage and 50 per cent of the enrolment at the postgraduate stage. In professional courses like agriculture, engineering or medicine, the extent of hostel facilities provided is already fairly high. We do not share the view that all students in these courses should be necessarily provided with hostel facilities. In our opinion, it is necessary to emphasize the provision of hostel facilities for the courses in arts and science, at least for the immediate future. In order to cut down the costs of this programme, it would be necessary to keep the design of the hostels as simple as possible. Moreover, the running costs should be kept down to the minimum and there should be provision for a good deal of self-help by the students.

11.68. For the use of non-resident students who do not have adequate facilities at home—the number of such students is extremely large in the towns and cities—day-study centres and library seats should be provided on a liberal scale. The target to be aimed at should be to provide day-study centres for about 25 per cent of the non-resident students. These should also have subsidized or low-cost cafetarias working on the principle of self-service.

11.69. **Guidance and Counselling.** A guidance and counselling programme which would assist the students in the choice of courses, indicate the lines of remedial action and help in dealing with emotional and psychological problems should be an integral part of the educational facilities provided in institutions of higher education. For an effective guidance service, it would be necessary to have at least one counsellor for every one thousand students on the roll. Smaller institutions may share a counsellor who will work in each of the institutions on a part-time basis. The organization of such a service will require a large number of professionally trained counsellors. We suggest that a project for their training should be organized in some university competent to do so.

11.70. The employment, information and guidance bureaux of the National Employment Service and the student advisory bureaux which have been existing in a number of universities have been doing useful work. The former have been collecting, compiling and making available to the students occupational and employment market information, information regarding preparation for different careers, training facilities, apprenticeships, scholarships, etc. They have also been placing students in employment. In the absence of counselling services with fully qualified counsellors, they have also been offering advice and help to the students in planning their careers. The student advisory bureaux were originally set up by the Ministry of Education to provide information regarding facilities for higher education abroad, but now also provide information regarding facilities in India. Since educational and occupational information is closely interlinked, it is recommended that these bureaux may be combined to form an information and employment centre which should function directly under the supervision of the dean of students.

11.71. **Student Activities.** It is necessary that student's energies are channelled into meaningful and challenging pursuits. This would be partly achieved through intensification of curricular programmes to which we have already referred. But that is not enough. It is also necessary to develop a rich and varied programme of co-curricular activities, which would include lectures, debates, essay competitions, group discussions, cultural programmes and contests, study circles, social service camps, NCC, tours and excursions, sports and tournaments, publication of students' journals, educational film shows, conduct of student libraries, canteens and cooperative stores and welfare activities connected with financial and medical assistance to students. Many of these activities are even now a part of the programme in good institutions. They are rich in educational stimuli and help to develop and strengthen certain valuable attitudes and qualities such as cooperation, initiative, self-confidence and leadership. These should be organized, not only during termtime but also during vacations which is more suited for some of the programmes.

11.72. **Administration of Welfare Services.** The advice, support and initiative of the vice-chancellor or principal are indispensable for an imaginative and effective programe of student welfare. But such work is so complex and many-sided that it needs a full-time dean of student welfare to look after its implementation. He should be an educationist with tact and vision trained specifically for the job and should be given sufficient status and authority to command respect and cooperation from the students and the staff. He should be expected to participate in academic work to the extent possible and regarded as a member of the academic community.

11.73. **Student Unions.** Student unions represent an important way of providing student participation in university life outside the classroom. Properly organized, they help in self-governent and self-discipline, provide a healthy outlet for students' energies and give the students useful training in the use of democratic methods.

11.74. It is for each university to decide how its students' union will function and we would welcome a good deal of experimentation. But some broad principles can be indicated.

(1) Membership of the student unions should be automatic in the sense that every student should be presumed to be its member. But every student should be expected to choose at least one activity organized in the institution *e.g.*, arts society, football club, drama association, etc., and pay the required subscription. There should be no separate payment for the membership of the students' union as such. Each of the activities will thus have funds of its own and these would be handled by appropriate committees.

The funds of the central union—to the extent they are needed—would be formed by contributions from each activity committee. The university or college should also give aid to the central union as well as to the different activities.

(2) It may be desirable to elect the office-bearers, not directly by the large body of students (many of whom are freshmen), but indirectly by the different students' societies in the university who would send selected representatives to the union executive.

(3) There should be some disqualifications for office-bearers. For instance, persons who have spent two or more years in the same class should be disqualified.

(4) The successful working of student unions depends to a large extent upon the mutual trust and confidence between the teachers and the students. Greater teacher involvement in union acivities should, therefore, be ensured. We would strongly commend the establishment of a university or college union in which all teachers and students automatically become members. All committees of the union and various activity groups should have teachers on them and it should be their responsibility to guide the students tactfully on right lines without curbing their freedom to decide for themselves.

11.75. In some of the institutions, the educational objectives of student unions are being well realized and they are functioning satisfacorily. But in a majority of intitutions, and particularly in recent years, they have tended to function like trade unions presuming to represent students' interests *against* those of the teachers and authorities. This idea should be firmly and definitely discouraged. A university or college is an academic fellowship of equals where things can be discussed and decided reasonably, and the joint committees of teachers and students which we have recommended have this purpose specifically in view. These should be fully utilized to ascertain and redress the genuine difficulties of students. There is a general and, perhaps on the whole justified, complaint on the part of students that the college or university authorities sometimes take no notice of these difficulties and deprivations till they are backed by some form of so-called 'direct action' which has really no place in an educational institution. When, however, they are confronted by a strike or demonstration or some kind of violence, they sometimes yield abjectly and students get the unfortunate impression that it pays to break the rules of discipline and good conduct. There is no justification for such administration. The members of the staff, the principals and vice-chancellors should all learn to be sympathetic, understanding, responsive and reasonable and yet decisive and firm, when necessary, in their dealings with students. What binds together students and teachers in a deep and creative partnership is the sharing of common interests, mutual regard and sense of values, and working together for their main purpose which is the pursuit of knowledge and discovery. Anyone who is not committed to this philosophy or prepared to honour it has really no place in an institution of higher education.

11.76. It would be useful to convene a conference of representatives of the students' unions in universities and colleges once a year, for the purpose of considering various problems of common interest such as the improvement of discipline and the promotion of academic excellence. Such a conference could also promote a sense of participation in the student community in the development of universities and colleges, apart from affording them an opportunity to express their views on matters that concern their studies and well being. We suggest that the UGC should take initiative in convening and financially supporting such an annual meeting.

11.77. **Student Discipline.** In the last couple of decades, so much has been written about problems of student unrest, its numerous ugly manifestations and the causes responsible for it that it is not necessary for us to repeat the details. Briefly, there have been many ugly strikes and demonstrations —often without any justification—leading to violence, walk-out from classrooms and examination halls, ticketless travel, clashes with the police, burning of buses and cinema houses and, sometimes, even manhandling of teachers and university officers. There is a variety of causes which has brought about these ugly expressions of uncivilized behaviour *e.g.* the uncertain further facing educated young men leading to a sense of frustration which breeds irresponsibility the mechanical and unsatisfactory nature of many curricular programmes; the totally inadequate facilities for teaching and learning in the large bulk of institutions; the poor student-teacher contact—many a student goes through the entire undergraduate course without exchanging a word with his teachers; the inefficiency and lack of scholarship on the part of many teachers and their failure to interest themselves in the students' problems; the absence of imagination and tact combined with firmness on the part of heads of institutions; the prevalence of what has come to be known as teacher politics in some colleges and universities, the attempt by political parties to interfere in their work, and by no means the least, the impact of the conditions of public life in the country, the falling standards of discipline among the adults and a weakening of their civic consciousness and integrity.

11.78. While such incidents and their contributory factors have been a feature of higher education for some years past, what is particularly disturbing at present is the noticeable trend towards a progressive deterioration and the fact that these acts are increasingly committed quite unapologetically and on irrelevant and frivolous grounds. This is specially regrettable in view of the considerable expansion of opportunities for youth that independence has initiated and of the critical challenges that the nation is facing in the fields of both defence and economic and cultural development. In such a situation, sociological explanations are not enough. Indeed, unless they indicate a feasible solution of the problem and lead to effective action, mere explanation is likely to be mistaken for justification. Urgent steps are, therefore, needed to curb these trends and to ensure that, whatever else education may or may not aim at doing, it should at least strive to enable young men and women to learn and practise civilized norms of behaviour and commit themselves honestly to social values of significance. It is also necessary to remember that the responsibility for the situation is not unilateral—it is not merely that of the students or parents or teachers or State Governments or the political parties—but multilateral. All of them share it, together with many factors in the objective situation and no effective solution is possible unless each agency responsible for the malaise does its own duty. Some of the remedies for students' unrest, therefore, go beyond the education system. But even if we leave them out, there are two major things that the education system itself can and must do:

- —remove the educational deficiencies that contribute to it; and
- —set up an adequate consultative and administrative machinery to prevent the occurrence of such incidents.

11.79. The first of these measures, the improvement of the educational process, is the heart of the problem. The discipline which higher education cultivates should aim at self-discipline—discipline directed from within, which does not depend primarily on external control. Moreover, such discipline can grow only if it is deeply related to the pursuit of deeper goals in life and rises out of interest and devotion to scholarship. In other words, the incentives to positive discipline have to come from the opportunities that the institution presents and the intellectual and social demands it makes on the students. From this point of view, we have emphasized, throughout this Report, the need to improve standards in institutions at all stages of education, including colleges and universities. We have also stressed the need, side by side, for providing a better standard of student services. Unless this is done, a radical cure to the problem is not possible.

11.80. With regard to the second of these measures, we would like to emphasize that the whole of university life is to be treated as one and that all attempts at polarisation between teachers, students and administration should, therefore, be avoided. From this point of view we have made a number of important recommendations such as the appointment of joint committees of teachers and students, the establishment of a central committee under the chairmanship of the vice-chancellor or principal consisting of students and teachers, and where advisable, the association of students with the Academic Council and the Court. What we have to strive to generate is a spirit of comradeship between teachers and students based on mutual affection and esteem and on a common allegiance to the pursuit of truth, of excellence in many directions and of the good of the society as a whole. If this spirit could be created, many of the problems of discipline which bedevil our academic life at present will become easier to solve and, will, we hope, disappear in course of time.

NOTE

UNIVERSITIES AND COLLEGES

There has been since independence, a large expansion in the field of higher education. The number of universities has increased from 20 in 1947 to 64 in 1966. There are now institutions 'deemed to be universities' under Section 3 of the UGC Act. The number of affiliated/university colleges was 2,565 in 1965-66. A list of universities, 'institutions deemed to be universities' and the number of university/affiliated colleges of each university is given below:

Year of Establishment	University/Institution Deemed to be University	Number of Colleges
	A. Universities	
1857	Calcutta University	168
	Bombay University	58
	Madras University	157
1887	Allahabad University	6
1916	Banaras Hindu University (Varanasi)	18
	Mysore University	63
1917	Patna University	10
1918	Osmania University (Hyderabad)	61
1921	Aligarh Muslim University	4
	Lucknow University	18
1922	Delhi University	41
1923	Nagpur University	84
1926	Andhra University (Waltair)	61
1927	Agra University	143
1929	Annamalai University (Annamalainagar)	..
1937	Kerala University (Trivandrum)	140
1943	Utkal University (Bhubaneswar)	72
1946	Saugar University	67
1947	Rajasthan University (Jaipur)	75
	Panjab University (Chandigarh)	149
1948	Gauhati University	75
	Jammu and Kashmir University (Srinagar)	34
1949	Roorkee University	..
	Poona University	46
	M.S. University of Baroda	6
	Karnatak University (Dharwar)	53
1950	Gujarat University (Ahmedabad)	125
1951	S.N.D.T. Women's University (Bombay)	17
	Visva-Bharati (Santiniketan)	8
1952	Bihar University (Muzaffarpur)	44
1954	Sri Venkateswara University (Tirupati)	28
1955	S.V. Vidyapith (Ballabh Vidyanagar)	13
	Jadavpur University (Jadavpur)	..
1956	Kurukshetra University (Kurukshetra)	4
	Indira Kala Sangit Vishwavidyalaya (Khairagarh)	32
1957	Vikram University (Ujjain)	39
	Gorakhpur University	41
	Jabalpur University	21
1958	Varanaseya Sanskrit Vishvavidyalaya	75
	Marathwada University (Aurangabad)	28
	A. Universities—(*Contd.*)	
1960	U.P. Agricultural University (Nainital)	4
	Burdwan University	43
	Kalyani University	..
	Bhagalpur University	44
	Ranchi University	35
1961	K.S. Darbhanga Sanskrit Vishvavidyalaya	28
1962	Punjab Agricultural University (Ludhiana)	5
	Punjabi University (Patiala)	9
	Orissa University of Agriculture and Technology (Bhubaneswar)	3
	North Bengal University (Siliguri)	19
	Rabindra Bharati University (Calcutta)	20
	Magadh University (Gaya)	34
	Jodhpur University	2
	Udaipur University	11
	Shivaji University (Kolhapur)	51
1964	Indore University	17
	Jiwaji University (Gwalior)	30
	Ravi Shankar University (Raipur)	44
	University of Agricultural Sciences (Hebbal)	3
	Andhra Pradesh Agricultural University (Hyderabad)	6
	Bangalore University	31
	Jawahar Lal Nehru Krishi Vishvavidyalaya (Jabalpur)	8
1965	Dibrugarh University	34
1966	Madurai University	..
	TOTAL (Colleges)	2,565
	B. Institutions deemed to be Universities under U.G.C. Act	
1958	Indian Institute of Science (Bangalore)	
	Indian Agricultural Research Institute (New Delhi).	
1961	Indian School of International Studies (New Delhi).	
1962	Gurukul Kangri Vishwavidyalaya (Hardwar).	
	Jamia Milia Islamia (New Delhi)	
1963	Gujarat Vidyapeeth (Ahmedabad)	
	Kashi Vidyapeeth (Varanasi).	
1964	Tata Institute of Social Sciences (Bombay).	
	Birla Institute of Technology and Science (Pilani).	

CHAPTER XII

HIGHER EDUCATION: ENROLMENTS AND PROGRAMMES

I. *Expansion of Facilities in Higher Education.* (2) Expansion of higher education in the first three plans; (5) Future enrolment policy in higher education.

II. *Selective Admissions.* (10) The need; (12) The main elements; (13) Determination of the number of places available; (15) Eligibility; (16) Methods of selection; (18) University Boards of Admissions; (19) Central Testing Organization.

III. *Part-time and Own-time Education.* (21-22).

IV. *Location of Affiliated Colleges.* (25) Small colleges.

V. *Expansion of Postgraduate Education and Research.* (27-31).

VI. *Higher Education for Women.* (32) Need for expansion; (33) Mixed or separate colleges; (34) Courses in higher education specially meant to serve the needs of women.

VII. *New Universities.* (36) The Calcutta University; (37) Metropolitan universities; (38) Additional universities for States and Union Territories; (39) Precaution to be taken while establishing new universities; (40) New Central Universities; (43) Deemed universities.

VIII. *Reorganization of Courses.* (45) Courses for the first degree; (47) Courses for the master's degree in arts and science; (49) Research degrees; (50) Interdisciplinary studies; (52) Study of social sciences; (57) Area studies; (58) Study of humanities.

IX. *Educational Research.* (60-65).

12.01. In this chapter we discuss problems relating to expansion of higher education and allied questions. These will include the regulation of the expansion of the university system in terms of manpower needs for national development; the selection of students; the establishment of new universities and colleges; and the development of new courses in higher education. We also propose to discuss some problems relating to the development of educational research.

EXPANSION OF FACILITIES IN HIGHER EDUCATION

12.02. **Expansion of Higher Education in the First Three Plans.** One of the important features of educational development in the post-independence period has been the rapid expansion of professional education in engineering, medicine and agriculture and of science courses for the first and second degrees. This was necessitated by the programmes for economic development undertaken in the first three plans. By and large, this expansion has outstripped the facilities available (in real terms) and has had an adverse effect on standards. At the same time, there has also been a rapid expansion in arts and commerce courses at the first degree level; and this has been dictated, not so much by the enrolment capacity of the institutions concerned or the employment opportunities available, but by the pressures of public demand which have increased immensely on account of the reasons which have been discussed more fully elsewhere[1]. The effect of this expansion on standards has been even more adverse.

12.03. Table 12.1 gives the enrolments in higher education during the first three five year plans.

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[1] Chapter V.

TABLE 12·1. ENROLMENTS IN HIGHER EDUCATION (1950-51 to 1965-66)

(000's)

	1950-51			1955-56			1960-61			1965-66 (Estimates)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Arts, Commerce and Science												
1. Undergraduate courses in arts and science	153	22	175	249	46	295	313	82	396	550	147	697
2. Undergraduate courses in commerce	16	..	16	27	..	27	38	..	38	61	1	62
TOTAL .	169	22	191	276	46	322	351	83	434	611	148	759
Postgraduate												
3. M.A. & M. Sc.	14	2	17	21	4	25	38	9	47	62	16	78
4. Research	1	..	1	2	..	3	4	1	4	6	1	8
TOTAL .	15	2	18	23	4	28	41	10	51	69	17	86
Professional												
5. Undergraduate	46	4	50	74	7	82	131	15	147	195	33	227
6. Postgraduate and Research .	4	..	4	6	1	7	12	1	13	20	2	22
TOTAL .	50	4	54	81	8	89	143	16	160	215	35	249
GRAND TOTAL .	234	28	263	380	58	439	535	109	645	895	200	1,094
Percentage of total enrolment to population in the age-group (18—23) .	1·2	0·1	0·7	1·7	0·3	1·0	2·2	0·5	1·4	3·3	0·8	2·1

Source. For sources and details of tabulation, please see Appendix I.
. . =Negligible.

Note. (1) The totals do not tally on account of rounding.
(2) For state-wise distribution of enrolments in higher education see chart on p. 301.

Some interesting points emerge from this table:

(1) Enrolments at the undergraduate stage in arts, commerce and science courses have increased from 191,000 in 1950-51 to 759,000 in 1965-66 or at an average annual rate of 9.6 per cent. The enrolment of girls at this stage shows considerable improvement—the number of girls enrolled for every 100 boys increased from 13 to 24.

(2) In postgraduate courses in arts and science and in research, the total enrolments have increased from 18,000 in 1950-51 to 86,000 in 1965-66 or at an average annual rate of 11 per cent. The enrolment of girls shows a considerable improvement at this stage also—it rose from 13 for every 100 boys in 1950-51 to 25 in 1965-66.

(3) In professional education[1], enrolments have risen from 54,000 in 1950-51 to 249,000 in 1965-66. The rate of growth is faster than that in arts and science—at 10.7 per cent per year—but a little less than that at the postgraduate stage.

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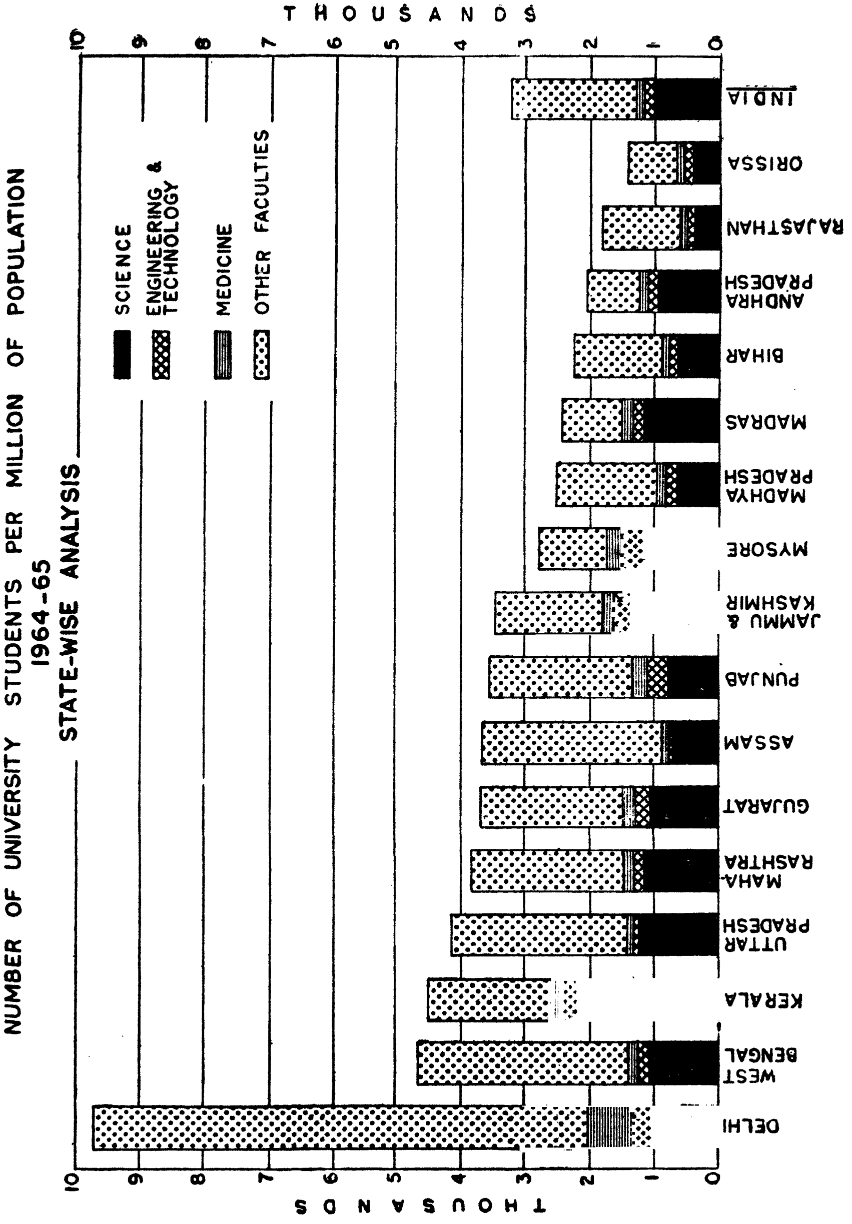
[1] This includes courses in agriculture, teacher training, engineering and technology, law, medicine, veterinary science, forestry and a few others. In the statistics published by the Ministry of Education, all courses in commerce have been classified as 'professional'. We have, however, followed the decision of the Planning Commission and regarded the courses in commerce for the first degree as forming part of general education and comparable with courses in arts. Courses for the second degree (M. Com.) have been classified as 'professional'.



NUMBER OF UNIVERSITY STUDENTS PER MILLION OF POPULATION
1964-65
STATE-WISE ANALYSIS

(4) The professional courses like engineering or medicine, which are generally longer and take five to six years, are really comparable to the postgraduate courses in arts and science. It will be seen from Table 12.1 that, in 1950-51, the enrolment in the post graduate courses of arts and science was 18,000 or about one-third of the total enrolment in professional education in that year. By and large, this proportion has remained fairly constant throughout the period under review. It highlights the need to increase the postgraduate courses, particularly in the sciences.

(5) Taking the enrolments in higher education as a whole, we find that these have increased, during this period, from 263,000 to 1.1 million or at an average annual rate of 10 per cent. The total enrolments in professional courses stood at 72,000 or 27.4 per cent of the total in 1950-51. In 1965-66, they had increased to 335,000 or 30.6 per cent of the total.

12.04. In using these statistics for internal or international comparison, some important points deserve emphasis.

(1) *Internal Comparison.* In most countries, the duration of the first degree course is about the same, irrespective of the fact whether it is a degree in arts, science, engineering or medicine. The degrees of the different faculties are, therefore broadly comparable. In India, on the other hand, the first degree in arts, commerce and science is of a much shorter duration, just like a 'half-way degree'[1]. It cannot, therefore, be equated with the first degree in agriculture or engineering or medicine which has a much longer duration. In fact, it is the postgraduate degrees in arts, commerce or science which are comparable with the first degrees in agriculture, engineering or medicine.

(2) *International Comparison.* In international comparison it would be wrong to compare our first degrees in arts, commerce or science with the corresponding first degrees of educationally advanced countries. What is really comparable is our second degrees in arts, commerce and science and first degrees in agriculture, engineering and medicine with the first degrees given by universities in the educationally advanced countries. This has been shown in the chart on page 303. The following conclusions which can be drawn from this comparison have an important bearing on the programmes of future development:

(a) The overall expansion of higher education in India is far too meagre in comparison with that in the more industrialized countries.

(b) What is even more important, enrolments in the professional courses, particularly in science and agriculture, are extremely inadequate for the needs of our economic development.

(c) Our system of higher education is more wasteful (lower ratio of output to input) than in countries like the UK or the USSR.

(d) The provision for part-time education or correspondence courses which is made on a very large-scale even in affluent countries like the UK, the USA and the USSR, is conspicuous by its absence in our system of higher education.

12.05. **Future Enrolment Policy in Higher Education.** What should be the enrolment policy in higher education during the next twenty years? Our recommendation is that the expansion of facilities in higher education should be planned *broadly* on the basis of general trends regarding manpower needs and employment opportunities. At present, there is an over-production of graduates in arts and commerce because of the adoption of this open-door policy; and consequently, there is a growing incidence of unemployment amongst them. On the other hand, there is a shortage of professional specialists and there is a consequent need to increase the facilities in professional courses such as agriculture, engineering, medicine, etc. and especially at the postgraduate stage in science and arts.

12.06. The ISI/LSE Paper[2] has made the following forecasts of trained manpower at this stage for 1985-86:

(1) *Undergraduate Stage (Arts, Commerce and Science).* These enrolments are expected to increase from 759,000 in 1965-66 to 2.2 million in 1985-86 or at an average rate of 5.3 per cent.

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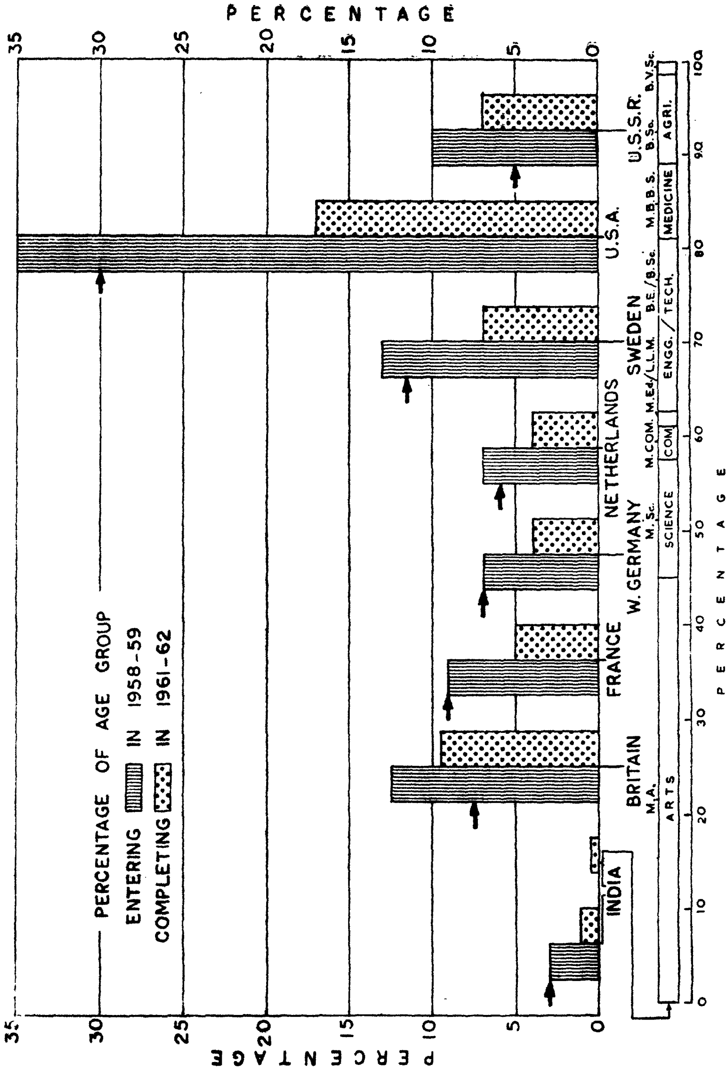
[1] See Chapter II.

[2] See Chapter V for details.

INPUT — OUTPUT IN HIGHER EDUCATION



NOTE:— 1. PORTIONS BELOW THE ARROW INDICATES PERCENTAGE TAKING FULL-TIME COURSES.
2. INPUT & OUTPUT FIGURES FOR INDIA RELATE TO YEARS 1959-60 & 1962-63 RESPECTIVELY.
3. FIGURES EXCEPT FOR INDIA ARE FROM THE ROBBINS REPORT ON HIGHER EDUCATION IN U.K. (1963).

(2) *Professional Education (Excluding Law).* The enrolments at the undergraduate stage in professional education, excluding law but including teaching, are expected to rise from 195,000 in 1965-66 to 972,000 by 1985-86 or at an average annual rate of 8.4 per cent as shown in Table 12.2.

TABLE 12·2. OUT-TURN, INTAKE AND ENROLMENT OF SPECIALISTS

	Out-turn			Intake			Enrolment		
	1960-61	1975-76	1985-86	1960-61	1975-76	1985-86	1960-61	1975-76	1985-86
Engineering									
First Degree .	7	43	92	14	65	129	40	229	473
Agriculture									
First Degree .	3	13	42	5	23	64	12	39	115
Medicine									
First Degree .	5	16	34	6	23	43	35	125	245
Teacher Training									
Graduates .	18	73	115	20	81	128	22	88	139
TOTAL	33	145	283	45	192	364	109	481	972

(3) *Postgraduate and Research.* The ISI/LSE paper gives no projections for this stage. In 1965-66, the enrolments at this stage were 108,000 as against a total enrolment of 986,000 at the undergraduate stage (or about 11 per cent). We recommend that this proportion should be raised, by 1986, to about 30 per cent. This will imply that these enrolments will rise from 108,000 in 1965-66 to about 960,000 in 1986 or an average annual increase of 11.5 per cent.

(4) *Law.* The ISI/LSE paper gives also no projections for legal education. We have assumed that the enrolments at the undergraduate stage in legal education would increase from 32,000 in 1965-66 to 76,000 by 1985-86.

12.7. On the basis of these assumptions, the total enrolments in higher education in 1975-76 and 1985-86 will be as shown in Table 12.3.

TABLE 12·3. PROJECTED ENROLMENT IN HIGHER EDUCATION IN 1975-76 and 1985-86

Type of education	Projected enrolment (in 000's)	
	1975-76	1985-86
1. Undergraduate (General) .	1,350	2,152
2. Undergraduate (Professional) as estimated by ISI/LSE Paper	481	972
3. Undergraduate enrolment in legal education .	50	76
TOTAL (Undergraduate) .	1,881	3,200
4. Post graduate . . .	321	960
TOTAL (Higher education)	2,202	4,160

It may be pointed out that

- in the first three plans, the enrolments in arts, commerce and science at the undergraduate stage increased by 568,000. During the next twenty years, they are expected to rise by about 1.4 million. The average annual rate of expansion will, however, be reduced from 9.0 per cent to 5.3 per cent;
- in professional education at the undergraduate stage (including

teaching and law) the enrolments increased, during the first three plans, by 177,000; in the next twenty years they will increase by 821,000, although the average annual rate of growth would be reduced from 10.6 per cent to 7.9 per cent: at the postgraduate stage, enrolments increased in the first three plans by 86,000; in the next twenty years these will increase by 852,000 and the average annual rate of growth will also have to be slightly accelerated from 11 to 11.5 per cent.

12.08. As pointed out earlier[1], these estimates of manpower needs and enrolments are tentative and will have to be continually revised in the light of experience gained. Moreover, these are estimates for the country as a whole. For practical implementation, they will have to be broken down according to the States; and finally an attempt will have to be made to correlate broadly the enrolment and output of the universities with these estimates, as revised from time to time. This is a difficult task. But we expect that the UGC under the general guidance of the Planning Commission will be able to cope with it.

12.09. The need for reducing the rate of expansion at the undergraduate stage in courses of arts and commerce has been discussed elsewhere[2]. Similarly, we have highlighted the need for expanding science education of quality and for increasing professional education at the undergraduate stage especially in agriculture, engineering and teaching[3]. It is, however, necessary to explain why a large expansion is also needed at the postgraduate stage and in research. An analysis of our proposals will show that this is fully justified because

- we expect a proportion of teachers even in lower secondary schools to hold the master's degree;
- we have recommended that a master's degree should be the minimum qualification for all teacher-educators both at the primary and at the secondary level;
- the lengthening of the duration of the higher secondary stage uniformly to two years and the expansion visualized at this stage will need a very large number of teachers with postgraduate qualifications;
- the large expansion visualized at the undergraduate and the postgraduate stages itself will need several times more teachers with postgraduate and research qualifications than at present; and
- the number of professional persons needed in research, agriculture, industry and the services has to be increased very substantially.

SELECTIVE ADMISSIONS

12.10. **The Need.** In the first three five year plans a policy of open-door access has been in operation in courses in arts and commerce in most of the affiliated colleges. A stage has, however, now been reached in the process of expansion when the policy of selective admissions will have to be extended to all sectors and institutions of higher education. If the present rate of expansion (at 10 per cent per year) is assumed to continue for the next 20 years, the total enrolments in higher education would be between seven and eight million by 1985-86 or more than twice the estimated requirements of manpower for national development. An economy like ours can neither have the funds to expand higher education on this scale nor the capacity to find suitable employment for the millions of graduates who would come annually out of the educational system at this level of enrolment. There is no escape but to link broadly the total enrolments in higher education to manpower needs, and to bridge the gap between these enrolments and the demand for higher education by adopting a system of selective admissions.

12.11 This conclusion, which is based mainly on two considerations—paucity of resources and relating the output of the educational system to manpower needs—can also be supported on academic grounds. Standards in higher education will tend to rise if there is competition for admission and the best students are selected on the basis of merit. We are happy to note that the earlier opposition to this principle is gradually lessening and our discussions with officials and non-officials whom we met has led us to conclude that public opinion is now largely in favour of making admissions to higher education selective. The reform should, therefore, be introduced as early as possible.

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[1] Chapter V.

[2] Chapter V.

[3] Cahpters IV, XIV, XV and XVI.

12.12. **The Main Elements**. Three main elements are needed for operating a programme of selective admissions in higher education:

- the determination of the number of places available in an institution in relation to teachers and facilities available to ensure that standards are maintained at an adequate level;
- prescription of eligibility by the universities; and
- selection by the institution concerned of the best students from amongst those who are eligible and seek admission.

12.13. **Determination of the Number of Places Available.** We suggest that each university decide in advance the number of students to be admitted in each course in its teaching departments and separately in each of its affiliated colleges on the basis of the facilities available. This is already being done for professional and science courses But even here, it is necessary to make the conditions more stringent. It is even more important to take similar steps in the courses in arts and commerce as well. The main difficulty is that no objective and specific criteria have been evolved for the purpose and the determination of the number of seats available with reference to the facilities provided is very elastic. We, therefore, recommend that the universities should evolve specific norms and criteria for determining the number of seats to be permitted in courses in arts and commerce. These should take into account, among other things, the student-teacher ratio, the facilities available for self-study, the library books, the journals subscribed, the number of library seats, the provision for tutorials, etc. The problem is so important that the UGC may consider the appointment of a committee to examine it in detail and make its findings available to the universities. It would then be possible to determine, with greater accuracy than at present, the number of students who can be admitted in arts and commerce courses with a reasonable hope of receiving a good education.

12.14. We would like to lay special emphasis on the determination of places in all affiliated colleges and in courses in arts and commerce because it is in these courses and in these institutions that most of the uncontrolled expansion takes place. It is imperative that the intake of students be fixed separately for each such institution and that this sanctioned strength should form an integral part of the conditions of affiliation. We have found many instances where the universities have not scrupulously discharged this responsibility and this has been one of the principal reasons for the deterioration of standards.

12.15. **Eligibility.** We have recommended elsewhere[1] that the present examination system should be reformed, that no one should be declared to have passed or failed in the higher secondary examination and that every student appearing should be given a certificate showing his performance. The universities, therefore, will have to prescribe from time to time, conditions for 'eligibility' *e.g.*, conditions for entitling a student to seek admission to their courses. These would naturally vary from university to university and from course to course. Care should, however, be taken to ensure that they are defined with some measure of elasticity so as permit the admission of all really promising students.

12.16. **Methods of Selection**. Once the number of places available is determined and the conditions of eligibility are prescribed, the stage is set for making selections for admissions. We visualize that, as secondary education expands and its quality improves, more and more students would become eligible and seek admission and that, in most institutions, the number of applicants for admission would exceed the places available. The position, however, would vary considerably from institution to institution. In good and well established institutions, the number of applicants would be several times the places available while in some others, it may be just equal to or a little more than the number of seats. The selection of students for admissions would, therefore, pose a problem of varying magnitude and complexity from institution to institution. We recommend that each institution should decide its own procedure for selecting the best students from among the eligible applicants on the basis of its traditions and local conditions.

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[1] Chapter IX.

12.17. The search for good and reliable methods of selection is one of the important problems in higher education and vigorous research is needed to evolve them. Even in advanced countries, satisfactory techniques of selection have not been developed as yet. While the search for good methods goes on, we have to begin the programme with such *ad hoc* methods as are available. We make the following general suggestions which, we hope, would be of use to institutions in devising their methods of selection.

(1) The common practice at present is to use examination marks rigidly as the sole criterion of merit and as the basis for selection. There is, however, little academic justification for it. Examination marks are notoriously unreliable for measuring attainment. Their prognostic value for determining the ability to profit from higher education is even more limited and several studies have shown that the correlation between school leaving examination marks and success in a college is not significant. Not many problems arise, however, at the extreme ends of the scale and it is easy to select a first or high second class student for admission or to reject one who has just scraped through the examination. But as one approaches the border-line of eligibility, the examination marks cease to serve as a reliable guide. For instance, the present situation where a debate often takes place whether a student with 39.6 per cent marks should or should not be admitted (the prescribed marks for admission being 40 per cent), and where such a student may be admitted in one college or faculty but not in another, is Pickwickian, if not absurd. **We recommend that while the use of examination marks as a major basis for admissions may continue as an interim measure until better selection methods are devised, their arbitrariness or lack of reliability should be compensated, to the extent possible, by taking other relevant considerations into account and by making due allowance for the socio-economic handicaps of students so as to relate selection more directly to innate talent.** As was stated above, this is specially important in borderline cases.

(2) It would be desirable that, in selecting students for admission, the institution should take into consideration the examination marks, the school record, the proficiency of the student in fields not tested in the examination, and such other relevant factors. If necessary, there should be an interview and a written examination, specially designed for testing aptitudes in relation to the fields of study which the student desires to take up. The final selection should be made on the basis of all this evidence and not on examination marks alone.

(3) In very exceptional cases of students with unusual gifts in some limited field (*e.g.*, mathematics) it should be possible to relax even the minimum requirements prescribed for admission. It is by no means rare that a gifted student is unable to fulfil the minimum requirements for university entrance. If the rules on this score are rigidly and mechanically enforced, many a gifted student would never enter a university and this could be a serious national loss. In exceptional cases, therefore, the universities should have the right and the courage to suspend the rules and give admissions to students whose talent has been identified but who may not have been able to fulfil the entrance requirement for some reason. This authority may also be delegated to a few select affiliated colleges which can be trusted to maintain standards and exercise this right with care and discretion.

(4) A major objective of policy in selecting students for admission should be to secure social justice and to spread the net wide enough to catch all available talent. It will be necessary, therefore, to make some allowance for the handicaps created by the adverse conditions in which many students from rural areas, from urban slums and from the unprivileged classes have to study. From this point of view, the procedure for selecting students on the basis of 'school clusters' which we have already recommended for the award of scholarships[1] may be adopted for making admissions, especially to much sought-after quality institutions.

12.18. **University Boards of Admissions.** For the successful implementation of this scheme, it will be necessary to set up a suitable machinery responsible for the selection and placement of students, for giving them special tuition, where necessary, and for providing the necessary financial support. At present, selection is usually not dealt with as a serious problem either at the university or in the colleges. At the commencement of each academic year, it becomes a hectic activity and is then forgotten. It is obviously not possible to build up a good admissions policy on the basis of such intermittent experience. We recommend that each university should constitute (if it does not already have one) a Board of University Admissions, which should include representatives of the teaching departments of the university, affiliated colleges and the university administration. Its function should be to advise the university about all matters relating to admissions to teaching departments and the affiliated colleges, to review the implementation of admission policies from year to year, and to recommend any necessary changes. It should also be a responsibility of this Board to collect data relating to annual admissions, to analyse them so as to find out to what extent the objectives of the admission policies have been actually realized. The results should be published for general information. The UGC as a central clearing-house, should also undertake studies and co-ordination of developments in this field.

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[1] Chapter VI.

12.19. **Central Testing Organization.** The development of appropriate selection procedures for different courses of higher education is a technical process and it is necessary to create a suitable agency which will be able to deal with it effectively in due course. We recommend that the University Grants Commission may take the initiative in setting up a Central Testing Organization with the following objectives:

- to develop improved procedures for selection of students at various levels of university education and for various courses or branches of learning offered by the colleges and universities;
- to provide the necessary services to colleges and universities such as administering selection tests, supplying the test results and suggesting ways and means of utilising the results for selection;
- to promote research within the universities into testing and related areas, with special reference to improvement of selection procedures at the university level;
- to advise colleges, universities and other similar organizations with regard to the selection of students;
- to establish field contacts so as to determine the requirements of different universities and colleges for the selection of students and to coordinate these activities at the national level;
- to establish contacts with similar agencies in other countries; and
- to make a continuing study of new developments in the field, in order to refine and improve selection procedures further.

12.20. The work to be done by such an organization will be extremely difficult and cover a very wide field. It would, therefore, be unrealistic to expect that it would be able to make a definite impact on admission practices and procedures in the immediate future. It is all the more important, therefore, that a programme for its development be prepared in the current plan. This should be divided into two phases. The first phase, which may take about three years, should be devoted to the preliminary work needed to set up the organization and develop a few pilot studies and experimental programmes. In the second phase, to cover the next three years, we may expect the organization to be fully operative with the necessary staff, accommodation and equipment which would include a security printing press.

PART-TIME AND OWN-TIME EDUCATION

12.21. At present, a student at the undergraduate stage must either be admitted on a full-time basis or go without education altogether. This creates a great demand for full-time seats in colleges and leads to a deterioration of standards as the resources to provide all the seats needed are not available. One solution to this is to keep full-time seats strictly limited on the basis of resources available and to institute correspondence courses, part-time courses, evening courses, etc., for those who aspire to a university degree but are not able to get admission to the regular courses. This device is being increasinly used in many countries such as the USA, the UK, the USSR and Japan. The correspondence courses recently started by the Delhi University as a 'pilot project' have proved to be a promising experiment and are producing satisfactory examination results.

12.22. We recommend that the opportunities for part-time education through programmes like evening colleges, and for own-time education through programmes like correspondence courses, should be extended as widely as possible and should also include courses in science and technology (either at the degree or diploma level).

They will help to reduce the capital costs of expanding higher education and cut down even the recurring costs to a substantial extent, especially as enrolments grow. They are the only means to provide higher education to those who desire to study further but are compelled, on economic grounds, to take up employment at the end of the school stage. There need be no fear that they will lead to a deterioration of standards, especially if due care is taken to maintain personal contacts with the students receiving correspondence education by organizing academic programmes during vacations and holidays. In fact, it would be correct to say that, by and large, the standards in such courses tend to be better because of the more intensive motivation of the students. We suggest that by 1986 at least a third of the total enrolment in higher education could with advantage be provided through a system of correspondence courses and evening colleges. We also suggest that the UGC should establish a standing committee on part-time education.

LOCATION OF AFFILIATED COLLEGES

12.23. Most of the expansion of undergraduate education we have visualized above will have to be met in two ways—the expansion of the existing colleges and the establishment of new ones. The size of the colleges has an important effect on their costs and efficiency and it is, therefore, important to evolve a suitable policy in this matter.

12.24. We recommend that, in granting affiliation to colleges, the universities should emphasize the expansion of existing colleges, rather than the establishment of new ones. Unless there are strong reasons to the contrary, a college should have a minimum enrolment of 500 and it would be preferable to raise the enrolment in as many colleges as possible to 1,000 or more. In granting affiliation to a new college, care should be taken to see that its location is properly planned so as not to interfere with the proper growth of an existing institution and there should be a reasonable chance that it would grow into an institution of an adequate size within a period of about five years.

12.25. **Small Colleges.** One unsatisfactory aspect of the present situation is the existence of a very large number of colleges with a very small enrolment. The latest data available on the subject is given in Table 12.4.

TABLE 12·4. SIZE OF AFFILIATED COLLEGES (1964-65)

Enrolment	No. of colleges within the range	% of the total	No. of arts, science, commere colleges in the range	Percentage	No. of professional colleges in the range	Percentage
Less than 100	320	15·6	168	11·0	152	28·6
Between 100—299	602	29·2	391	25·6	211	39·5
Between 300—499	296	14·4	243	16·0	53	9·9
Between 500—999	457	22·2	373	24·5	84	15·8
Between 1000—1999	328	16·0	297	19·5	31	5·8
2000 and above	53	2·6	51	3·4	2	0·4
TOTAL	2,056	100·0	1,523	100·0	533	100·0

Source. Report of the University Grants Commission, 1964-65, p. 1.

N.B. See also chart on p. 311.

It will be seen that about 15.6 per cent of the colleges are in the unenviable position of having less than 100 students. If an enrolment of 500 students is regarded as the very minimum below which a college may tend to be uneconomic and inefficient, about 60 per cent of the affiliated colleges are below this level.

12.26. We carried out an examination of the small colleges with an enrolment of less than 100. Data was available for 168 institutions only, but even from this some interesting facts emerged.

(1) *Age.* The classification of the colleges according to the year of establishment is as follows:

Year of foundation	Percentage of colleges founded in the period
Before 1947 . . .	5·4
1948—57 . . .	6·5
1958 . . .	2·4
1959 . . .	7·7
1960 . . .	6·0
1961 . . .	12·5
1962 . . .	7·1
1963 . . .	16·7
1964 . . .	35·7

It will be seen that 72 per cent of these small colleges were established during the four-year period—1961-64. Whether these colleges can increase their strength with age cannot be predicted, especially in view of the fact that 28 per cent of the colleges which were established before 1960 (and some of them even as far back as 1947) have continued to have a strength of less than 100.

(2) *Population of the Locality.* Population figures of the locality in which the colleges are situated were available in respect of 114 colleges. The position is as under:

Population of the locality (in 000's)	No. of colleges
5 and below .	6
5—10 . . .	14
10—20 . . .	21
20—40 . . .	22
40—75 . . .	20
75—100 . . .	3
100—150 . . .	4
150—200 . . .	3
200—400 . . .	10
400—800 . . .	4
800 and above .	7
TOTAL .	114

It will be seen that 63, or more than 50 per cent of the colleges are situated in towns whose population ranges from 10,000 to 75,000 and there are 31 such colleges in areas whose population exceeds 75,000. It is also significant that there are 11 small colleges with enrolment of less than 100 in big cities whose population exceeds 400,000. Only 20 colleges can be said to be situated in sparsely populated areas (10,000 and below).

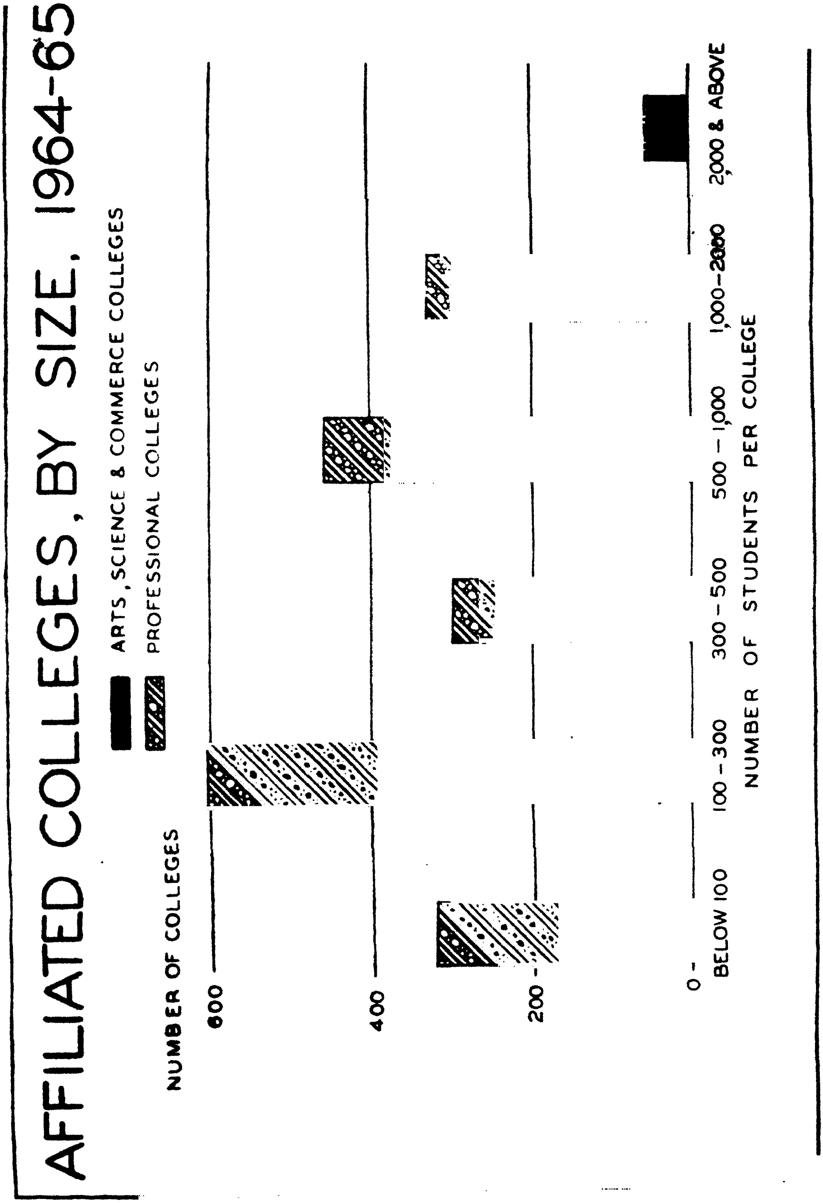
(3) *Enrolment of Men and Women Students.* Of these colleges, 36 enrolled only men students, 32 only women students; in 97, admission was open to both men and women students.

(4) *Backward Areas.* Some of these colleges are in backward areas with large tribal population and it is understandable, that they may take some years to grow.

Planning the location of colleges is a problem of great importance. We recommend that the UGC should undertake a study of the problem with special reference to the small colleges and advise the universities regarding the manner in which this handicap may be reduced as much as possible.

EXPANSION OF POSTGRADUATE EDUCATION AND RESEARCH

12.27. The bulk of postgraduate and research work has to be concentrated in the universities and their constituent colleges rather than in the affiliated colleges. Indian universities have, in the past, been mainly concerned with undergraduate education and, to a limited extent, with postgraduate work and research. As a result of the lead given by the UGC in the second and the third plans, however, the number and enrolments in the postgraduate departments in the universities have increased considerably. But even now, the share of the colleges in the enrolments is disproportionately large: the distribution of M.A. and M.Sc. students between the teaching departments of the universities and the affiliated colleges is roughly in the proportion of 4:3. This is an unsatisfactory state of affairs because, barring a few outstanding colleges, real research facilities in affiliated colleges are very limited or non-existent. Moreover, the facilities in terms of competent teachers, libraries, laboratories, etc., in a large majority of colleges are weak and the standard achieved by students admitted is low. We recommend that the bulk of postgraduate and research work should be organized in the universities or in university 'centres'



AFFILIATED COLLEGES, BY SIZE, 1964-65

where good programmes can be developed co-operatively by 3 or 4 local colleges under the guidance of the university. Only very good affiliated colleges of long standing which have done creditable work at the undergraduate (or postgraduate) stage may be allowed to carry on postgraduate and research work, if the needed facilities are provided. In our opinion, the universities and the university centres will have to shoulder the responsibility for about 80 per cent of the postgraduate and research work. To support it properly, they will also have to undertake undergraduate work meant primarily for gifted students. This should cover about 10 per cent of the enrolment. The universities thus have a tremendous additional responsibility to undertake: the enrolments in their departments, and constituent colleges would have to be increased from 200,000 in 1965-66 (undergraduate 155,000) and postgraduate and research 45,000) to about 1.1 million in 1985-86 (undergraduate 320,000 and postgraduate 750,000).

12.28. It need hardly be stressed that though it is necessary to increase the enrolments at the postgraduate stage in response to developmental needs, this should always be contingent on adequate increase in material and staff resources. One has to resist the temptation to open or to tolerate departments of universities or colleges doing inferior postgraduate work without the essential facilities.

12.29. It is also necessary to have a strict policy for admission of students to postgraduate and research courses. We should not encourage students who go on to M.A. or M.Sc. merely to while time away or on the off-chance of being able to find some employment later. This is often permitted in many institutions at present, either due to misplaced charity or to inflate numbers, not realising that such measures constitute a grave injury to the interests of higher education in the first instance and to the community itself in the long run. We suggest that a rigorous test of admission should be introduced for all postgraduate courses. A mechanical dependence on marks in the first degree examination will not serve the purpose. In a pilot project undertaken by the Delhi University to analyse its examination results over the last 4 or 5 years, it was found that the chances of a third division student in B.A./B.Sc. securing first, second or third division in the M.A./M.Sc. examination are 0.29, 0.29 and 0.47 respectively. This is undoubtedly a limited study but it is certainly an important pointer. It is, therefore, necessary to take into account, in addition to the marks obtained at the qualifying examination, the students' cumulative record of performance, his interest in extracurricular and co-curricular activities, and his aptitude, motivation and general suitability for higher education.

12.30. In view of the centralization of postgraduate and research work indicated above, it will be necessary to provide an adequate number of scholarships and hostel facilities at this stage. As suggested earlier[1], scholarships should be available to about 50 per cent of the students at this stage and these should be supplemented by loan scholarships. Once a student has been selected for admission to a postgraduate course on merit, we should strive to ensure that no financial difficulty comes in the way of his completing his studies: either a scholarship or a loan scholarship should be available to him so that he can devote himself to his project without anxiety and uncertainty.

12.31. We would like to emphasize one point. The Centre will have to assume far greater responsibility than in the past for the development of postgraduate education and research and for the development of universities. This is a sector of very high priority and it has a seed value and can improve the whole field of education. At present, this is not the case. The extent of facilities provided at this stage are inadequate and its quality leaves much to be desired. Consequently, we do not get enough good teachers for colleges. This dilutes undergraduate education and makes it difficult to get good teachers for secondary schools. In its turn, secondary education is thus diluted and it becomes difficult to get good teachers for elementary schools. The only way to break this vicious circle is to expand the facilities in postgraduate education and research and what is even more important, to improve their quality. For this purpose, we would move in the direction of making the Government of India almost exclusively responsible for postgraduate education and research. In this connection we would like to quote the US President's Science Advisory Committee which in its recent report on *Scientific Progress, the Universities and the Federal*

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[1] Chapter VI.

Government (1960), prepared under the chairmanship of Professor G. T. Seaborg, now Chairman of the Atomic Energy Commission, states as follows:

> Both basic research and graduate education must be supported in terms of the welfare of society as a whole. It is in this large sense that the role of the Federal Government is inevitably central. The truth is as simple as it is important: whether the quantity and quality of basic research and graduate education in the United States will be adequate or inadequate depends primarily upon the government of the United States. From this responsibility the Federal Government has no escape. Either it will find the policies—and the resources—which permit our universities to flourish and their duties to be adequately discharged—or no one will.

These are wise and powerful words, and they apply to us no less.

Higher Education for Women

12.32. **Need for Expansion.** There is a prevailing view that it is no longer necessary to give special attention to women's education at the level of higher education since women are taking advantage of it in increasing numbers adequate to the needs of society. Shortages of educated women available for taking up positions of directional and organizational responsibilities in various professions and occupations, however, point to the need for special efforts to expand women's education at the college and university stage. The figures of comparative enrolment of men and women students at the higher education stage reveal that the proportion of women students to the total enrolment in Indian Universities was about 13 per cent in 1955-56, about 17 per cent in 1960-61 and about 21 per cent in 1965-66. Thus, in one decade the proportion has increased from 13 per cent to 21 per cent and at present the proportion of women students to men students is 1:4. This proportion is not in keeping with the changing needs of Indian society nor with the needs of economic and social development. We feel that in view of these needs the proportion of women students to the total enrolment at this stage should be increased to 33 per cent during the next ten years to meet the requirements for educated women in different fields. To achieve this target we have recommended two programmes elsewhere *viz.*,

(1) a programme of scholarships and financial assistance to women students in colleges and universities on a liberal scale: and

(2) a programme of the provision of suitable but economical hostel accommodation for women students with all the necessary amenities on a large scale. Liberal grants should be provided by the Government of India for this purpose as also by the State Governments. Both these programmes are particularly necessary to encourage girls from rural areas to take advantage of higher education. At present their numbers are very small in colleges and universities as compared to those of girls from urban areas.

12.33. **Mixed or Separate Colleges.** At the college level, the local historical tradition and the general social background determine whether there should be mixed colleges or separate colleges for women. A uniform policy of co-education is not necessary for this level of education. Conditions vary from State to State. In a State like Maharashtra, mixed colleges are preferred by women students and their parents, and the number of mixed colleges is much larger than that of separate colleges for women. In the State of Madras, however, which is equally advanced in the matter of women's education, separate colleges for women are preferred and their number is much larger. It would, therefore, be for each State Government to decide its policy regarding co-education at this stage. The existing practice can be allowed to continue in each area, except where a separate college for women is so small that it is not economically viable. Care should be taken by the college authorities and the staff in mixed colleges to ensure that women students receive necessary incentives and encouragement for active participation in co-curricular and extra-curricular activities. The authorities and the staff of women's colleges should ensure that they and their students do not become isolated from the general stream of university life.

At the postgraduate level there is no justification for separate institutions for women. Here men and women students should work together under the best guidance that is available.

12.34. **Courses in Higher Education Specially Meant to Serve the Needs of Women.** As at present, women students should have free access to courses in arts, humanities, sciences and technology. It would be wrong to restrict their choice or to compel them to take particular courses. The more academic type of girls with ambitions of pursuing careers of research or teaching at the college or university level, or in professions such as medicine or technology should have all the opportunities and incentives for doing so.

For a large number of women students, there is need for linking up higher education with specific avenues of employment where the services of trained and educated women are urgently required. There needs to be an emphasis on technical and vocational element in such courses. Some of the professional fields where women's services are required and where there are shortages at present, are those of education (teaching), social work, nursing and a series of occupational fields such as nutrition, dietetics, institutional management, etc. All such courses have been stressed during the second and the third five year plans and facilities for them have been expanded. We must make every effort to expand these courses according to developmental needs and to improve them in the light of their objectives.

Home science has been introduced in 33 universities and is gradually receiving recognition as an academic discipline. Home science, in addition to giving good general education, should equip students on a scientific basis to work in the professional fields of dietetics, food technology, family welfare work, extension work in community development and Welfare Extension Project, research work in projects and schemes of ICMR, ICAR and Council of Child Welfare.

Nursing has been introduced as a course at the B.Sc. level in universities with the purpose of preparing nursing staff at higher levels. It is introduced in separate colleges for women and every attempt is made to plan a scientific and professional course which would have an academic value as well as the necessary professional training of a higher level. The expansion of this course should be according to the requirements of the profession.

Education as an elective at the B.A. or B.Sc. level has been introduced in 11 universities. In each of these universities, there are more women than men who offer this course. The course has at present only a general education value and does not serve the purpose of professional preparation even partially. Elsewhere we have suggested the value of concurrent and integrated courses in general and professional teacher education. We feel that such courses will prove to be popular with women students. With the fewer employment avenues open to women, they make up their mind about joining the teaching profession at an early stage. They would welcome such concurrent courses if the first year of the three year degree course offers a basic general course which would lead to pedagogy as well as to some other field. We suggest that besides these institutions we have already proposed for this purpose, a few women's arts and science colleges should be selected for the introduction of the concurrent course and given additional special grants for the purpose.

Courses in social work are offered in several universities. This is a field where there appears to be a need for designing special courses to meet the requirements of those fields of social work where women's services are required. As other avenues open up to women, courses in these fields will have to be designed.

In the third five year plan, there was a scheme to set up a National Institute for Women for giving high level training to women candidates in organization, administration and management to enable them to take up responsible positions. Women trained on these lines would be needed for implementing many national plans and projects, particularly in social services to meet the requirements of voluntary organizations and to provide competent personnel to take up positions that are becoming increasingly available to them in the industrial sectors. For want of funds it has not yet possible to set up such an institution at the national level. We are of the opinion that three or four universities with good business administration and management departments should set up wings for giving such high level training as is needed by women for the above purpose. This will reduce the cost of training and will also make the training more effective and efficient.

We would like to suggest that one or two universities should set up research units to deal specifically with women's education. These should take up follow-up studies of educated women, consider women's education from the point of view of employment opportunities available to women, and ensure proper planning of women's education particularly at the stage of higher education.

NEW UNIVERSITIES

12.35. In view of the expansion visualized for the undergraduate and postgraduate stages, the establishment of some new universities is inevitable. It is even desirable for reducing the size of some existing universities. This problem has already become acute in big metropolitan cities and is likely to become so in several other universities within a few years. Moreover, we feel that administrative regroupings of existing colleges through the establishment of new universities would be necessary in certain cases.

12.36. **The Calcutta University.** We may illustrate the point by referring to one of the oldest universities in India—the University of Calcutta, which has rendered pioneering and valuable services in the past to the development of higher education in the country, specially in the field of postgraduate studies and research. At the present time, however, one witnesses in the university a rapidly increasing and almost unmanageable undergraduate population. Half a dozen colleges in the city of Calcutta account for about 50,000 undergraduate students. Many of these do not have even a modicum of essential facilities—adequate teaching staff, accommodation, libraries, laboratories. Sometimes more than one college functions in the same building and with the same equipment, but in different shifts, and practically under one management though with separate governing bodies. Teaching and learning are often carried on in a factory-like environment where teachers and students have hardly any personal contacts whatsoever. On the academic bodies of the universities are some persons who are not competent by their academic attainments or administrative experience to play a constructive role in the working of the university. There is a considerable time-lag between the conduct of examinations and the declaration of results. The University needs a major reorganization. Some of the leading colleges could be granted an amount of autonomy in the organization of their courses of studies and conduct of examinations. It would be an advantage to set up a Council of Affiliated Colleges to deal specifically with the problems of colleges. Given the seriousness of the situation, it may be advisable for the State Government in consultation with the UGC and the Government of India to have the affairs of the university closely examined by a small competent body with a view to finding a way out of the present impasse.

12.37. **Metropolitan Universities.** There is also a concentration of large student population in the cities of Bombay, Delhi and Madras, though their problems have to be seen in a somewhat different setting. We welcome the proposal to set up a second university in the city of Delhi and recommend that the other metropolitan cities of Bombay, Calcutta, and Madras should have, by the end of the fourth plan, two universities each which would supplement to some extent the work of each other. Moreover, some of the well-established colleges may be raised to autonomous status with power to grant degrees, to begin with, at the undergraduate stage. The relevant details and pattern of the new universities should take into account local conditions and circumstances and ensure that they are able to play a vital and constructive role in the civic life of the metropolis. We suggest that the problems be examined by the UGC in consultation with the State Governments concerned.

12.38. **Additional Universities for States and Union Territories.** Additional universities would also be needed in other States. For instance, there has been a strong and justifiable demand from the State of Kerala for an additional university. The State of Orissa has also a good case. There has also been a demand for the establishment of a university for the hill areas of the North-Eastern Region. This proposal has been supported by a Committee appointed by the UGC, and by the Working Group on Educational Development of Hill Areas set up by the Ministry of Education in April 1965. We agree with this recommendation. The people in these hill areas share common economic disabilities and their remoteness and comparative inaccessibility render their problems peculiarly difficult. A great deal needs to be done to explore the economic potentialities of the area. Moreover, the people rightly feel that unless the promising local youth are trained for providing leadership in the various fields of economic and social development, their progress will remain arrested. They are anxious to be more fully integrated with the life of India as a whole and with the larger world of scholarship and learning. To this end, they have realized that the establishment of a university is one of the major measures which will spearhead economic and social development in the area. The hill areas of Uttar Pradesh and the tribal tracts in Orissa have also demanded the establishment of universities.

12.39. **Precautions to be Taken while Establishing New Universities.** We wish to emphasize that the ban on the establishment of new universities which is proposed in some quarters is neither desirable nor feasible. Instead, it is necessary to concentrate on the adoption of essential measures to ensure that their establishment leads to a substantial improvement in standards and raises the output and level of research. It must further be pointed out that the establishment of new universities can be justified only when competent men and physical facilities required for the purpose are available and can be secured and that it would be wrong to create a situation in which there could be an undue dispersal of intellectual talent, funds and administrative ability, all of which are in scarce supply at present. From this point of view, we make the following recommendations:

(1) No new university should be started unless the agreement of the UGC is obtained and unless adequate provision of funds is made.

(2) In many cases it may not really be necessary to start a new university. The object in view can be met by developing, under the auspices of a university, one or more postgraduate centres wherever a number of local colleges can make a co-operative effort to provide facilities for postgraduate teaching. This scheme is being tried in some States and the results are encouraging. The university can help to strengthen such centres in many ways. It can depute its teachers to work for stipulated periods at these centres. It can sanction additional staff for the purpose, if necessary. It can establish a general library for postgraduate students of all the colleges. It can expand existing laboratories or build new ones. It can assist in the construction of additional hostel facilities. In short, an arrangement of this type can secure most of the advantages of a university without throwing on the exchequer all the administrative and other expenses involved in the establishment of a new university. Besides some of these centres could very well meet all the needs of a developing area for some time and thereby prepare the ground for the eventual establishment of a full-fledged university.

(3) Most of our universities have, and will continue to have, a large number of affiliated colleges. We feel that some experimentation with different types of university organization to deal with this situation would be useful. For instance, a good organization would be one in which a university has a strong core of teaching departments combined with about 30 affiliated colleges situated in close proximity. In such a case, there would be a proper balance between the teaching wing and the affiliated colleges and each could develop without dominating the other. When this balance is upset either by the weakness of the teaching departments or by the overwhelming large number of affiliated colleges, a tension often arises between these two wings and hampers progress. Such a situation should be avoided.

(4) An experiment which we recommend in this regard is to make some or all the universities in a State join together in a 'consortium', as it were, to operate all the affiliated colleges in the State. This possibility should be explored by the UGC.

(5) There should be at least one non-affiliating university in each State—unitary or federal.

(6) We find that the preparation made for the establishment of new universities is, more often than not, perfunctory, and adequate time is not allowed between the passing of the Act and the commencement of the work of the university as such in the sense of admitting students. It would be desirable to set up a convention in this regard that a new university should not be established in a place where a university centre has not been in operation for some time; and that a time of 2-3 years should be allowed to elapse between the appointment of the first vice-chancellor and the direct commencement of the university's work. During this time, the vice-chancellor should be assisted by a Planning Board which should consider all matters regarding the development of the university. The valuable pioneering work done in the UK since 1947 in the establishment of new universities can provide useful guide-lines in this regard.

(7) With the large number of universities that have already been established and others that will be during the next 20 years, the problems of university collaboration and cooperation, which have been rather neglected in the past, assume great significance. At the State level, the collaboration of all the universities in the State is essential in matters like research in problems of socio-economic development in the State, the development of the regional language, or relating their output to their manpower need. But such collaboration is even more important at the national level. The universities should join together, at the regional and national levels, in co-operative programmes and supplement mutually their available facilities, especially in research. In fact it should be a constant endeavour of educational policy to treat all universities as national institutions and to build up collaborative and co-operative programmes which cut across State, regional

or linguistic frontiers. The promotion of these programmes should be the special responsibility of the UGC.

12.40. **New Central Universities.** One proposal placed before us suggested the establishment of a central university in every State. In discussions with State Governments and universities, we found that it had a mixed reception: some States welcome it either because a Central university is a prestige institution or because it would thereby be relieved of the financial responsibility, but many oppose it. After careful consideration, we are inclined to agree with the latter view.

12.41. Two main arguments have been put forward in support of the proposal, namely, it will save these universities from local pulls and pressures which are unfavourable to the proper development of higher education and that it will help to raise standards. We are afraid that we cannot accept either of these contentions. Not only one university in a State, but *every* university has to be protected from unfavourable local pressures and pulls. This, in essence, is the problem of university autonomy which is discussed more fully in the next chapter. We would, however, like to point out that we will have to discover and adopt ways and means, other than 'centralization', for protecting it. Nor can we agree that more liberal assistance from the Centre will necessarily improve standards or that a Central University would *ipso facto* be a better university.

12.42. The main object of this proposal is to ensure a more liberal flow of central funds to selected universities in the States. We concede that this is necessary. But instead of selecting one university in each State for this purpose once and for all, it would be better to make more liberal Central assistance available to all State universities on the basis of their performance and merit. This is already being done to a limited extent and the UGC gives developmental grants to these universities. We have recommended larger resources to be placed at the disposal of the UGC so as to increase the amount of Central assistance for developmental purposes. In addition, the amending Bill for the UGC Act proposes to authorise the UGC to give maintenance grants also to the State universities. If these provisions are fully utilized, the main objects of this proposal will be served in a better way and its disadvantages would be avoided. Also the proposal for the establishment of major universities which we made in Chapter XI partly meets the objects of this proposal.

12.43. **Deemed Universities.** In recent years some of our high-level institutions such as the Indian Agricultural Research Institute at Delhi, the Indian Institute of Science at Bangalore, have been brought into the university system by deeming them as universities under Section 3 of the UGC Act. We consider this a welcome development. There is in our educational system a need for institutions having the academic status and privileges which ordinarily belong to a university, but with more specific and limited functions and scope. While such institutions in their limited field should maintain the highest standard of teaching and research, their organizational set-up need not be the replica of a university. Our recommendation regarding autonomous colleges will be of some use in this context. We would like to stress that, in deeming institutions as universities under the UGC Act, the most careful attention should be paid to the question of educational standardas. This provision under the Act gives scope for experimentation and innovation, but it should not become a cheap side-or back-door to university status.

REORGANIZATION OF COURSES

12.44. We shall now turn to a discussion of the general lines on which courses in higher education need to be reorganized. We shall mainly deal with considerations common to courses in arts, commerce and science. The courses in agriculture, engineering and technology are dealt with elsewhere[1].

12.45. **Courses for the First Degree.** The link between the subjects taken at the school stage and those opted for at the first degree should be less rigid than at present. It is because of this link that specialization starts undesirably early. A student wishing to take physics for his M.Sc., for instance, is now often required to opt for it as early as in Class IX. We think that there is no justification for such rigidity and that it should be open to a student to opt for a combination of subjects at the first degree stage, even though some of these may not have been taken by him at the school. Similarly the combination of subjects permissible for the first degree should be more elastic than is generally the case at present, both in the arts and in the sciences. The subjects which, in the past, seemed to be far apart, are now seen to be much closer and at the higher stages many of the traditional frontiers are breaking down. Therefore, combinations like mathematics and economics or philosophy, physics or chemistry with biology, education or with any other subject, should be permissible. It is true that, by and large, the majority of students would continue to study the subjects they had studied in some depth at the school and that most combinations of subjects will be along traditional lines. But there will be some exceptions to this general principle and the educational system should provide for them.

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[1] Chapters XIV and XV.

12.46. The question of general, special and honours courses at the undergraduate stage is of great significance. We define a 'general' course as one in which the student takes three subjects at about the same depth. The 'special' course would be different in kind and provide for the teaching of three subjects of which one would be taken at a much greater depth than the other two. The 'honours' course would be more challenging and require study at a higher level. The general courses should be provided at two levels—pass and honours. The special courses, however, need be provided only at the honours level. In order to economise resources, however, we recommend that

(1) the universities, which have much better facilities, should only provide for special courses or for general (Honours) courses. For them to provide pass courses is to underutilize the resources available.

(2) the affiliated colleges should, as a rule, have an option to provide either for the general courses—both at the pass and honours level—or the special courses depending upon the availability of teachers and facilities. To economize on costs, however, it may be desirable to prescribe the minimum enrolment needed for the general (honours) and special courses.

12.47. **Courses for the Master's Degrees in Arts and Science.** There is an urgent need to introduce an element of flexibility and innovation in the organization of the courses for the Master's degree. Border-line and inter-disciplinary subjects are fast becoming areas of major study and research. To bring these into focus in university life, it is necessary to provide, in addition to our present one-subject courses, combination courses consisting of, say, one major subject and one or two subsidiary or related subjects. For instance, universities may provide for various combination courses between education, sociology, philosophy, psychology, economics, law and mathematics. Similarly, it should be possible to combine two modern Indian languages or physics and mathematics, chemistry and mathematics or physics; or physics and life sciences. What is important is to break the present rigidity and uniformity.

12.48. There need be no undue emphasis on the courses for the Master's degree leading to a high level of specialization and research. This should be an important but only one of the objectives of the course. It is necessary to design courses with two other equally valid objectives *e.g.*, preparing teachers for schools, and catering for the needs of students who are still interested in broad connected areas and who may attempt specialization later at the Ph.D. level. The postgraduate curricula, therefore, should be so framed that a student can either be introduced to a variety of modern subjects or receive intensive training in one or two special fields. Specialization should be attempted only in cases where facilities exist. Where they do not, universities should aim at providing a general broad-based course so that the student is equipped adequately for undertaking undergraduate teaching and for entering into such other professions as require an advanced knowledge of the subject. Unless the rigidity which characterizes the present-day courses in postgraduate education is reduced, it will not be possible to provide adequately for the needs, aptitudes and abilities of the students.

12.49. **Research Degrees.** As is well known, the standards of research degrees in some universities and in certain subjects are high and comparable to those abroad But the same cannot be said of many subjects and all universities. A collection of research topics in various science subjects which have been accepted for the award of Ph.D degree in most universities is a curious mixed bag and if one were to pick at random, one is most likely to meet with a topic which both by its very formulation and by its scope would be considered to be behind the times by at least ten to twenty years. This is partly due to the fact that in most universities the problems *are given to* and *not selected by* the student on the basis of his ability and facilities available for work. The guide generally determines the nature and scope of the problem to be solved by the student. It is true that some of the topics undertaken by students, at least in some universities, belong to the scientific forefront. But, by and large most of the topics taken up for investigation do not reflect a modern content or approach. With a view to improve the existing situation, we make the following recommendations:

(1) A student should be expected to work from two to three years for a Ph.D. degree. Its basic objective is to train in research methodology, comprehension of scientific literature, ability to make critical analysis, to draw suitable inferences and to present the findings in a clear, logical and scientific way and to be able to criticize as well as to accept criticism. It should be regarded as the beginning of the real research career of the student rather than as its climax or end.

(2) Very often, the preparation of students obtaining the Master's degree is not adequate enough to enable them to embark on a research investigation worthy of the Ph.D. degree. It would, therefore, be desirable that candidates entering on the Ph.D. courses should spend the first year partly in advanced training in the subject, requiring attendance at some lectures and tutorials of an advanced nature.

(3) The students for the Ph.D. courses should be carefully selected. The eligibility of the guides as well as the facilities needed should be carefully specified. There should be a limit on the number of students to be guided by a teacher at any given time; and there should be a time-limit within which the student should be expected to submit his thesis and a similar time-limit for the university to take a decision on it.

(4) The procedures for evaluation should be improved. While the guide who has supervised the work should be one of the members of the Board of Examiners, no degree should be awarded unless reports of all examiners are unanimously in favour of the proposal. As far as possible, evaluation should be done by Indian experts in the subject. A *viva voce* examination or a defence of the thesis should be considered essential before the degree is recommended.

(5) A study of a second world language such as Russian, German, or French should be obligatory for all Ph.D. students. It may be desirable to make this compulsory even for the courses for the Master's degree, at least in certain subjects.

(6) It would also be desirable to institute a higher degree than the Ph.D. in such universities where it does not exist already. This degree, namely, Doctor of Science, representing the highest award should be given mainly on the basis of research work of recognized merit published in international scientific journals and should be scrutinized by a team of scientists both from within India and outside. It would be desirable to have an interval of at least five years between the award of Ph.D. and D.Sc. degrees.

12.50. **Inter-disciplinary Studies.** Special efforts need also to be made to promote inter-disciplinary studies in universities which have adequately staffed departments in related subjects. This will need new combinations of subjects, new methods of cooperation between different institutions and new patterns of staffing. The field is vast, but by way of illustration, we may refer to one field: education. For a study of its problems in all their complexity, an inter-disciplinary approach is needed between the departments of education, sociology, psychology, comparative religions, economics, public administration and law. Each subject department of a university such as physics, chemistry, or history can work on problems of school curricula and methods in its own field. Courses in education can be combined with courses in most other subjects, both at the undergraduate and postgraduate levels. It is for this reason that we have emphasized the establishment of schools of education in four or five big universities to begin with. Some further details of their working are discussed elsewhere[1].

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[1] Chapter IV.

12.51. To further this objective, a broad-based staffing pattern is also needed. For instance, it would be extremely helpful to have educationists on the staff of a school of sociology just as it is desirable to have sociologists on the staff of a training college. The same conditions, *mutatis mutandis*, apply to other departments[1].

12.52. **Study of Social Sciences.** Mainly for historical reasons, the universities and colleges of India have tended to concentrate on the study of languages and humanities and the study of the social sciences, and also behavioural sciences, which are often grouped together within the wider field of the humanities, has generally remained underdeveloped. The only social science which has received adequate attention is economics. Political science has more recently been introduced as a field of study, either as a separate department or in association with history and economics. Sociology and social anthropology are taught in a few universities and geography has been introduced as a subject of advanced study in some others. A number of special and separate institutions that have been established in recent years in this field are evidence of the growth of interest in the social sciences. Much, however, remains to be done and the full importance of the social sciences is yet to be recognized. The present practice of associating the social sciences closely with the humanities, or even of including the social sciences in the wider field of humanities, may be justified historically or on the ground that they all have as a common goal—the study and knowledge of Man. But, because of the specific aims of their research and special methods involved, the social sciences are tending to diverge more and more from the humanities. By their recent achievements and their future prospects they must be recognized as an autonomous group of disciplines.

12.53. In the course of the last forty years, the social sciences have undergone a tremendous change, less spectacular and less accessible to the general public than natural sciences and technology, but no less deep or extensive. The application of social sciences has brought about important results in the economic and social development of modern societies and even in the policies of governments. They, therefore, find an important place in higher education and research, as well as strong encouragement and financial aid from governments, private organizations and industrial, agricultural or commercial concerns. There is now a tendency to introduce into the curriculum of secondary education, at least at the higher secondary stage, some rudiments of the social sciences and their methods.

12.54. We must admit that, despite remarkable achievements of individual scholars and institutions, the social sciences have not so far obtained in India the place and standing they deserve, due not only to their specific value, but also to their direct use in Indian society and Indian education:

We recommend that the social sciences should be given a significant position in Indian universities and research institutions for the following reasons amongst others:

(1) Along with the natural sciences, if not to the same extent, the social sciences can be used to create a scientific outlook. Teaching and research in sociology, social psychology, economics and other social sciences, using precise methods such as statistics and other instruments of measurement, can develop in students as well as in teachers, a spirit of accuracy, critical analysis, investigation and experimentation, which any good educational process has the duty to encourage and promote.

(2) The social sciences are essential tools for the study of the conditions and needs of modern society and, without a proper use of their methods and results, control of economic, social, financial and demographic developments or manpower requirements is impossible. Proper planning, which is important for all countries but especially so for India, needs a larger number of persons with extensive knowledge and training in the social sciences.

(3) Modern societies need, as they become more industrialized, not only engineers, technicians and skilled workers, but also a large number of well educated and trained people for what is usually called 'the third sector of the economy': education, public administration, private

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[1] The need for inter-disciplinary studies in the natural sciences has been discussed in Chapter XVI.

management, commerce, distribution, communications, information services, etc. Specialists in these fields need good education in the social sciences.

12.55. The recent emphasis on science education has sometimes been blamed for the slow development of social sciences. This is not quite correct. As we have stressed in this Report, this emphasis is essential and will have to be continued. But we visualize only about 30 per cent of the university enrolment doing pure science and an equal proportion doing applied science in the form of professional courses like engineering or medicine. The present trend of over-expanding enrolment in science (with a consequent adverse effect on standards) is to be discouraged. As we visualize it, the proportion of students studying social sciences could be about 30 per cent or almost the same as that of the students of natural sciences. Moreover, we think that there can be no water-tight divisions between these disciplines. The trend in higher education will, in future, be to provide a balanced education for all, *i.e.*, while a sudent may specialize in any field of his choice in the three major areas of languages and humanities, social sciences, and natural sciences, he will also have some grounding in the other two fields.

12.56. Two main difficulties have to be overcome if social sciences are to grow, *viz.*, they must receive adequate financial support, and they must draw a proper share of the talent available[1]. From this point of view, we recommend that

- there should be adequate provision of scholarships in the social science courses;
- the choice of subjects at the first degree stage should be elastic and it should be possible for students to combine study of a social science with any other group of subjects;
- the financial assistance available to universities for the development of social sciences should be considerably increased; and
- high level schools or Centres of Advanced Study for allied groups of social sciences should be developed in a number of universities.

12.57. **Area Studies.** There is a growing awareness of the value and importance of developing a gradually expanding programme of area studies at suitable centres in the country. India has close social, political and economic relations with several countries and there is a pressing need for a large number of Indian scholars with specialised knowledge of the life, institutions, culture and languages of specific regions of the world, particularly those with which India is directly and more intimately concerned. The establishment of the Institute of Russian Studies, New Delhi, which is intended to promote studies relating to the Soviet Union is a welcome step in this field. The American Studies Research Centre, Hyderabad, provides facilities for the study of American life and culture. The Indian School of International Studies, New Delhi, is a pioneer institution that has embarked on a number of courses relating to the study of various regions. Chinese studies are being developed in the Delhi University. However, there are areas like East Asia, South and South East Asia, West Asia, Africa and Latin America, and countries which are India's immediate neighbours which deserve more attention in our academic programmes than they have hitherto received.

In view of the limited resources available in terms of competent personnel, foreign exchange, etc., it should be our endeavour to develop a significant and effective programme of area studies in a few selected universities and institutions. Such a programme would require intensive courses in the languages of the areas concerned, and the introduction of optional groups of papers in certain social science subjects having reference to the different areas selected for intensive study. Close interdisciplinary collaboration would also be necessary for the programme. Scholars having the right aptitudes may have to be selected for periodical visits to the specific areas or regions. It may also be necessary to invite selected teachers or scholars from foreign countries for short periods.

We understand that the University Grants Commission has appointed a standing advisory committee to develop the programme of area studies in the universities. We hope that steps will be taken to promote this significant programme expeditiously. This is a need which in the present circumstances brooks no delay.

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[1] At present, the vast bulk of the talented students opt for engineering and medicine—the most coveted of careers—and we were told in several universities that the quality of students in the social science courses was going down.

12.58. **Study of Humanities.** The need for strengthening the humanities cannot be overstressed. In the course of history, the civilization and culture of India have made striking contributions to humanist thought, and the values of our society and the finest traits of our national character are derived from creative studies made in these fields. It would be a sad day if the present preoccupation with science and technology resulted in the neglect of the humanities, which are already starved of talent and resources. In the humanistic studies it is not so much financial resources, as the quality of scholars and teachers and the spirit by which they are inspired that count. Such a spirit towards the humanities needs to be nurtured. The best talent in these fields of learning should receive the same recognition and encouragement as is offered to scientists and technologists[1].

12.59. While dealing with the programme of science education we have referred to the inevitability of our dependence on developments in advanced countries with which we will not be able to catch up in the foreseeable future. To redress the balance, we like to think that our scholars will make significant contributions to the sum total of human knowledge and experience in the fields of the social and pedagogical sciences and humanistic studies, where our old traditions and the present challenges posed by social developments present unique opportunities for creative work.

EDUCATIONAL RESEARCH

12.60. We have already recommended that education should be treated as a separate discipline at the university level[2]. We shall here discuss some problems relating to the development of educational research.

12.61. Educational research is still in its infancy. Its quantity is small and its quality, mediocre or poor. This is due to several reasons. Most of this research is confined to training colleges which have very inadequate facilities for research and few competent people to guide it. In the absence of specialized institutions doing research on their own, the bulk of research comes to be done by students for the university degrees—M.Ed. and Ph.D. The M.Ed. dissertations hardly deserve to be called research, although they have a useful place as an exercise in training the students in research techniques. At the Ph.D. level, the programme has been weak in methodology and has suffered further because only those students who have done the B.T. or the M.Ed. can be admitted to it. There are very few scholarships available for research students in education. Again, a good deal of the research done so far has been in the field of mental testing and other fields have received but little attention. Ancillary services like documentation, computation, consultation, etc. have not been developed. The country does not have a single journal devoted to educational research. No central clearing house has been created and there has been considerable duplication of work. Even the little research that has been done has largely remained in the archives, and administration has not used its findings for formulation of policies. The total expenditure on educational research—estimated as less than half a million rupees a year—has been negligible.

12.62. If this picture is to be changed, urgent steps have to be taken to develop educational research and relate it effectively to the formulation of educational policies and improvement of education. From this point of view, we make the following recommendations:

(1) A documentation centre and a national clearing house in educational research should be developed at the NCERT. We welcome the decision of the Council to start a journal devoted to educational research. In collaboration with this Centre, steps should be taken to organize periodical conferences of research workers so that their isolation is broken and educational research acquires a professional status.

(2) Educational research has to be developed in teams and in inter-disciplinary fields. While all training colleges should do some research, the restriction of educational research to training colleges

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[1] Advanced Centres in these disciplines should be developed at suitable universities. Special care is to be given to the fostering of studies in the classical languages and literatures, and the high standards achieved in the past in the study of Sanskrit, Arabic and Persian should be maintained and surpassed. The great importance of historical studies needs to be underlined; a free and democratic society striving for national integration and new human values cannot afford to overlook the relevance of history in our times.

[2] Chapter IV.

has hampered its growth. We have recommended earlier that Schools of Education should be established in four or five universities[1]. It will be the special responsibility of these schools to develop educational research in a big way in collaboration with other departments. The other universities also can take up different projects in their own way. We find that, as a rule, the universities have shown little interest in the study of educational problems, even those relating to higher education. For instance, socio-economic studies of their student body can be done by the department of sociology; studies in wastage and stagnation in their courses can be done by the department of mathematics and statistics. But by and large this is not done. We recommend that universities should make it a point to conduct research in educational problems relating to their own work and, wherever possible, to that of the secondary and primary schools in the neighbourhood. Outside of them, special organizations like the NCERT and the State Institutes of Education will have to develop large programmes of research.

(3) It is desirable to set up a National Academy of Education consisting of eminent educationists, broadly on the lines of the National Institute of Science, to promote educational thought and research. This should essentially be a non-official, professional body. But it should receive adequate financial support from the Government of India.

(4) While the NCERT should do research on its own and in collaboration with the State Institutes of Education and run a central clearing house, we do not think it advisable to make it responsible for distribution of grants for educational research to other institutions, especially because we expect the universities and other organizations to enter the field in a big way. This is essentially a responsibility of the Ministry of Education which it should assume. We recommend that a strong Education Research Council should be set up in the Ministry of Education for this purpose. It should be presided over by a professional educationist of distinction and consist of representatives of the universities, training colleges, NCERT, State Institutes of Education, and institutes interested in educational research and some educationists and educational administrators and planners. Its main function would be to distribute funds placed at its disposal for educational research and to bring out periodical reviews of its development for the information of all concerned. It should have a secretariat of its own in the Ministry of Education.

(5) As time passes, we expect that educational research will become more and more sophisticated. There is, therefore, urgent need to provide good specialized training for research work and services for data-processing, statistical analysis and consultation.

(6) It would be the responsibility of the NCERT at the national level and the State Institutes of Education at the State level to bridge the serious gap between educational research and current school practices. A similar role will have to be played by the UGC in the field of higher education. It is for them to bring to the notice to the universities, State Education Departments, schools and teachers, the new developments in education and the findings of educational research and their implications for the teaching and learning and organization of education.

12.63. The problem of priorities in educational research is complex. Several problems on which research is needed on a priority basis have been indicated in the different parts of this report. It has to be noted, however, that the priorities in educational research at the national level, from the point of view of the educational planner or administrator, may be very different from similar priorities at lower levels, or from the point of view of teachers. We do not, therefore, think that any rigid framework of priorities need be evolved. It should be left to the different agencies which give research grants or conduct research to decide for themselves the important problems which demand immediate attention. These decisions will be taken by the Education Research Council in the Ministry of Education at the national level, by the State Departments of Education (in consultation with the State Institutes of Education) at the State level and by the universities, training colleges and teachers interested in research work. The decentralization of initiative in this matter has to be emphasized.

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[1] Chapter IV.

12.64. The total expenditure on educational research has to be increased considerably, the goal being to devote about one per cent of the State expenditure on education to it. This is merely an indication and an expenditure of this magnitude will take some years to be usefully incurred. What is important to note in the immediate future is that no worthwhile project of educational research should be allowed to be shelved for want of financial support.

12.65. It is necessary to bring together officers of the Education Departments working in the field with the research workers in training colleges and the universities. For instance, the schools of education which we have recommended, should make it a point to hold annual conferences of selected district education officers, headmasters of schools at all levels and teacher educators. As far as possible, these should be of inter-State character. In these conferences, a two-way process will take place. The field officers of the Education Department can place before the staff of the school of education, the practical difficulties which they come across and to which they can find no solution. On their part, the teachers in the school of education can acquaint the field officers of the Department with the latest findings of research and can take up their problems for future study and investigations. This fruitful combination of field-work with research will have to be greatly emphasized in future, if the innumerable problems that face us in educational development have to be solved quickly and satisfactorily.

CHAPTER XIII

THE GOVERNANCE OF UNIVERSITIES

I. *University Autonomy.* (3) The concept of university autonomy; (9) Autonomy within a university; (10) Autonomy within the university system; (11) Autonomy in relation to outside agencies.

II. *University Finances.* (18) Grants to State universities from the UGC; (22) Grants-in-aid to the State universities from State Governments; (27) Financial accountability of universities.

III. *Role and Appointment of the Vice-Chancellor.* (32—40).

IV. *Legislation for Universities.* (42) The Court; (43) The Executive Council; (44) The Academic Council; (45) Academic Planning Boards; (46) Convocations; (48) General Recommendations; (49) Universities and the Law Courts.

V. *Affiliated Colleges.* (52) Evaluation; (54) Council of Affiliated Colleges; (57) Government colleges; (59) Private colleges.

VI. *Coordination and Promotional Machinery.* (62) The Inter-University Board; (67) The University Grants Commission.

VII. *Supplementary Note.* The Inter-University Board on University Autonomy.

13.01. Universities in the modern world have a multiplicity of functions, the most important of which are ***teaching, research,*** and *extension* involving direct contact with the community. Their enrolments, staff and budgets are becoming increasingly large and they are required to assume new functions and programmes. The problems of the internal government of universities and other institutions of higher education and of their relationship with the State are, therefore, becoming increasingly important and complex. We devote this chapter to the consideration of some important issues relating to the constitution and organization of universities, the management of university affairs, autonomy and academic freedom and related matters.

13.02. One preliminary observation may be made. There are some principles of governance (such as the maintenance of a clear chain of responsibility, delegation of functions and authority, insistence on economy and efficiency) which are common to all good organizations. But there are others which depend upon the nature of work and specific purpose of the organization. The character of a university as a society of teachers and students engaged in the pursuit of learning and discovery, distinguishes fundamentally the regulation of its affairs from, say, the profit-motivated management of commercial or industrial concerns or the administration of a government department, a municipal corporation, or a unit of the armed forces. Unfortunately, the problems special to university governance have not received adequate attention and universities in our country often tend to rely heavily on governmental rules and practices. What is worse, rules, procedures and techniques once adopted tend to be continued indefinitely in their original form even when changed conditions and circumstances have made them obsolete or incompatible with the real needs and interests of the institutions. Such rigidity seriously retards progress and development. A resolute effort needs to be made to evolve policies, techniques and practices, and a machinery for decision-making needed for a forward-looking and dynamic academic organization. Rules, regulations and techniques that hamper achievement of the real purposes of the university should be modified or scrapped—they should not be allowed to become straight-jackets into which all university activities must be fitted. It would be of real value if in some selected universities, groups of interested and knowledgeable persons, academic and administrative, could join hands to study seriously problems of academic government and administration, and suggest ways and means to bring about a radical improvement in the present somewhat chaotic situation. We recommend that the UGC should encourage the formation of such groups. It may also be desirable if, in a few selected universities, certain concerned departments like those of education, science, public administration and law can join hands to study the problems of educational administration and management of university affairs.

UNIVERSITY AUTONOMY

13.03. **The Concept of University Autonomy.** To begin with, a distinction needs to be made between university autonomy and academic freedom of university and college teachers. This freedom implies that a teacher cannot be ordered or required to teach something which goes against his conscience or conflicts with his conception of truth. In this context, we would also like to emphasize the freedom of teachers to hold and express their views, however radical, within the classroom (and outside) provided they are careful to present the different aspects of a problem without confusing teaching with 'propaganda' in favour of their own particular views. A teacher should be free to pursue and publish his studies and research; and speak and write about and participate in debates on significant national and international issues. He should receive all facilities and encouragement in his work, teaching and research, even when his views and approach be in opposition to those of his seniors and the head of his department or faculty.

13.04. In theory there is no serious restriction or curtailment of academic freedom, but we would like to see teachers practising more of it and vigorously. In fact, it is an inherent obligation of the academic community to play an active and positive role in critical examination, evaluation and evolution of concepts and policies over the entire spectrum of the society's concern and involvement. The universities have a major responsibility towards the promotion and development of an *intellectual climate* in the country which is conducive to the pursuit of scholarship and excellence, and which encourages criticism, ruthless and unsparing but informal and constructive. All this demands that teachers exercise their academic freedom in good measure, enthusiastically and wisely.

13.05. The proper sphere of university autonomy lies principally in three fields:

- — the selection of students;
- — the appointment and promotion of teachers;
- — the determination of courses of study, methods of teaching, and the selection of areas and problems of research.

13.06. In the use of its autonomy, the universities should be governed by one over-riding consideration—their commitment to truth in all fields of activity. This passion for truth must be inculcated in some measure in all their members and there should be some who are wholly dominated by it and find in it their real fulfilment. There is then a likelihood that the universities will gradually win not only self-respect but the respect of society and government and play their proper role in national life.

13.07. It is important to recognize that the case for autonomy of universities rests on the fundamental consideration that, without it, universities cannot discharge effectively their principal functions of teaching, research and service to the community; and that only an autonomous institution, free from regimentation of ideas and pressure of party or power politics, can pursue truth fearlessly and build up, in its teachers and students, habits of independent thinking and a spirit of enquiry unfettered by the limitations and prejudices of the near and the immediate which is so essential for the development of a free society. As Bertrand Russell has observed: 'Where independent thinking dies out, whether from lack of courage or absence of discipline, there the evil weeds of propaganda and authoritarianism proliferate unchecked. The stifling of criticism is thus a much more serious thing than many people realise. Far from creating a living unity of purpose in a society, it imposes a kind of insipid, brittle uniformity upon the body politic. It is a pity that men in places of power and responsibility are not more often aware of this.'[1]

13.08. In considering the question of university autonomy, we must recognize three (somewhat overlapping) levels at which it functions:

(1) autonomy within a university, e.g., autonomy of the departments, colleges, teachers and students in relation to the university as a whole;

(2) autonomy of a university in relation to the university system as a whole, e.g., the autonomy of one university in relation to another, or in relation to the UGC and the Inter-University Board (IUB); and

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[1] Bertrand Russell, *Wisdom of the West*, Doubleday Garden City, New York, 1959.

(3) **autonomy of the university system as a whole, including the UGC and the IUB, in relation to agencies and influences emanating outside that system, the most important of which are the Central and the State Governments.**

13.09. **Autonomy within a University.** Before considering the relations between individual universities and of the university system as a whole with external authorities, it would be desirable to discuss briefly the meaning of autonomy within the university itself.

(1) It is recognized that the representation of lay elements on the various governing bodies of the university is necessary and justified in view of the nature of relationship between the university and the society. It would, however, be contrary to the principle of university autonomy if the lay or non-academic members in these bodies assume a dominating and controlling position. Conventions should be developed which would largely shift the centre of gravity of authority to the academic wing of the university's government. In particular, care should be taken to see that the Academic Council is vested with the final authority in all academic matters. The function of the non-academic element should be mainly to present to the academics the wider interests of the society as a whole, but not to impose them; it should also serve to represent the views and interests of the academics to the wider society and thus make the smooth functioning of the university more easily possible.

(2) It is necessary to ensure that universities do not become administration or administrator dominated and to keep vigilant in this regard. The dominance, if one is to use that word at all, must be of the academic element, and the principal function of the administration is to serve the academic interests of the university.

(3) In the governance of a university, the principle that good ideas often originate at the lower levels of the hierarchy must be recognized and respected. The tendency to attach importance to ideas and proposals merely because they emanate from persons who happen to hold important positions is unhealthy and particularly out of place in a university where they must be judged objectively and on their intrinsic merit. As Sir Eric Ashby has observed: 'This principle of upward flow is vital to the efficient administration of a university and for the survival of autonomy and self-government.....Not all professors consult their lecturers before decisions are taken as scrupulously as they themselves expect to be consulted by the lay governors in similar circumstances. As faculty boards become larger, there is a temptation for an oligarchy of senior professors to take over the responsibilities of government on behalf of their more junior colleagues. That way danger lies, for any weakening of the principle of self-government within the academic body makes it harder to preserve self-government within the university as a whole and correspondingly harder to maintain the autonomy of the university in the modern democratic state.'[1]

(4) The departments of a university are its main operational units on the academic side. We are of the view that wider administrative and financial powers should be delegated to them. Each department should have a Committee of Management under the chairmanship of the head of the department consisting of all professors and some readers and lecturers elected by the staff. It should meet at least once a term to discuss the academic programme of the department, the requirements of laboratories and library, the delegation of duties and related matters, and its proceedings should be circulated to the Faculty and the Academic Council. It will be necessary to provide adequate secretarial assistance to each department for the purpose. In the case of large science departments, it may be advisable to appoint a deputy to the head of the department from amongst the professors or readers. He should be assigned specific functions by the head of the department with the approval of the University Executive Council.

(5) It is essential to recognize the freedom and autonomy of colleges. Our proposals for this will provide, subject to certain conditions and safeguards, greater freedom to colleges and result ultimately in the creation of autonomous institutions. They have been discussed more fully elsewhere.[2]

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[1] Sir Eric Ashby, *Technology and the Academics*, St. Marbins, New York, 1958, p. 106.

[2] Chapter XI.

(6) The university should be visualized as an integrated community in which the teachers are, as it were, 'senior scholars', the students are 'junior scholars' and the administration is a service agency to both. All attempts at polarization between teachers, students or administration should be avoided. We recommend the establishment of joint committees of teachers and students in each department and in every college to serve as a forum for the discussion and, where possible, for the solution of common problems and difficulties. The head of the institution—the vice-chancellor or principal—should be kept fully in touch with the work of the committees. In addition, there should be a central committee for the purpose under the chairmanship of the head of the institution consisting of some representatives of staff and students. A machinery of this type, if properly worked, would at least be able to find an adequate solution to the large number of small, easily remediable problems which, for want of due attention at the proper moment, often simmer into bitterness and later engender serious breaches of discipline. It will also, we hope, create better relations and develop a new sense of confidence between the teachers and the students.

(7) As one positive step to encourage students to take part in university government and to make them realize their responsibilities in the day-to-day functioning of the university, we recommend that representatives of the student community (including undergraduate students) should be associated with the Academic Councils and the Courts of the universities. In some universities in Europe and elsewhere, students are members of the Executive Council also.

13.10. **Autonomy within the University System.** It is implicit in the concept of autonomy, and desirable even otherwise, that every university should be entitled automatically to the membership of the IUB. The degrees conferred by a university should also be automatically 'recognized' by every other university in the country[1]. Further, a certain measure of division of labour among universities is necessary, and this applies more to some fields of study than others. In specialized areas like Chinese studies or nuclear physics or oceanography or astrophysics, where equipment is very expensive or qualified manpower scarce, the autonomy of each university to teach and to do research is naturally not absolute and must be modified in favour of some reasonable cooperative arrangement amongst them. The universities can initiate such division of labour, which is the only sensible way of dealing with the phenomenal increase in knowledge and specialization, either on their own or in consultation with the UGC, where necessary.

13.11. **Autonomy in Relation to Outside Agencies.** While universities must have this autonomy, it should be interpreted in the larger context of their obligation and responsibility to the nation and to mankind as a whole. For instance, the national needs for trained manpower have implications for the teaching functions of the universities; and similarly decisions about research which, in a way, must be taken primarily by the universities, cannot be taken in isolation from the economic and social needs of the country which must influence them in a large measure. Such decisions are national decisions in which the competing claims of different sectors of the society must be weighed against one another and in which long-range programmes must be balanced against immediate needs. It is apparent that the conduct of university affairs cannot be left *solely* to the academics; their relationship to social needs requires the admission of non-academic persons within the machinery of their government. The universities have thus to share their decisions with lay agencies or authorities outside the system just as they have to share them with one another or with organizations within the university system itself such as the University Grants Commission and the Inter-University Board. It is particularly in such problems that issues of university autonomy have to be handled with great skill and imagination and it becomes necessary to develop attitudes and conventions which will do justice to university autonomy as well as to the valid claims of society.

13.12. We give below some illustrations of the manner in which problems of this type can be handled.

(1) The admission of students is obviously an important aspect of university autonomy. But in the larger interests of society, regulations have to be framed for reserving some seats for under-developed

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[1] See paragraphs 13.64 and 13.65 *supra* for details.

social groups such as the scheduled tribes or the scheduled castes. Even in such cases, however, the discretion of the universities to judge the merits of the individual students should not be fettered; they should be able to select the best students from among the applicants within the under-privileged groups and, if necessary, to refuse admission. In some cases, a cooperative machinery for admissions has to be set up for a number of educational institutions, including those conducted by universities, *e.g.*, in technical colleges where admissions are normally made on a selective basis. The participation of universities in such an arrangement for educational and administrative reasons is justified and cannot be regard as an infringement of autonomy.

(2) Important problems of coordination arise with regard to national needs for trained manpower. We have recommended earlier[1] that estimates of manpower needs with regard to trained graduates in different fields such as agriculture, engineering, medicine, or teaching, should be prepared and the total output of the universities in the various faculties planned accordingly. This will necessarily imply that the development policies of the universities should be adequately co-ordinated to meet all the national requirements for trained manpower and steps should be taken to see that, so far as it is predictable, there is no over-production or shortfall in any sector. The decisions in such matters will, however, have to be joint decisions taken after adequate consultation. Since, in the last analysis, the implementation of these plans will be in the hands of the universities, Government must be persuasive and not lay down the law.

(3) Similar problems arise also with regard to research. When it is decided that the economic needs of the society require applied research on particular problems—decisions which must be made, in large part, outside the university—the universities must share the responsibility for it to some extent at least. They have, however, the right to insist that adequate resources for the purposes be provided so that standards of research are not compromised by following any short-sighted policies.

13.13. In matters relating to the national needs for trained manpower and research, an individual university should have the freedom to decide whether it will or will not participate and also to determine the extent of its participation, consistent with its other basic objectives. But the university system as a whole must meet the challenge of the situation. For this purpose, a suitable machinery for consultations should be developed between the universities, the representatives of university interests such as the UGC and the IUB and the representatives of Government Departments, both at the Centre and in the States. In the working of this consultative machinery, procedures and conventions should be developed for reaching decisions regarding numbers to be trained, courses of study, and problems of applied research. The most important element in these conventions should be a common appreciation that every task to be undertaken by a university must be carried out at the standard necessary and that the capacity of the universities to teach and to do research is not diminished as a result of the decisions taken. If, for instance, in preparing high level technical and medical personnel, the universities are asked to increase their enrolments suddenly without providing adequate facilities, it is not merely the universities that suffer but also the quality of the training which is essential for such personnel.

13.14. While instances of the type mentioned above indicate legitimate claims on the universities, there could be other claims or situations which involve an undesirable infringement of university autonomy. For instance, it would be wrong if universities were expected to owe allegiance to any particular political party, or individual, or attempted to further the interests of such parties or individuals. It is equally wrong, as people in power in public life and even those within the academic community itself sometimes do, to influence appointments for teaching or research posts and to interfere with the admission of students in general or of particular students to particular courses. Similarly, it is not proper that State Governments should try to give 'directives' to universities in academic matters such as affiliation of colleges. We also feel unhappy at restrictions placed on some of the universities in the country and at some recent attempts to curtail their autonomy. For instance, the universities in Bihar do not have the authority to recruit their teachers —this is done by the Public Service Commission of the State. There may possibly be good reasons for this decision. All the same, we are strongly of the view that the machinery for the eradication of any deficiencies in a university should be built into the university system itself. There have also been some other instances of the infringement on autonomy, although good sense has ultimately prevailed and led to their modification. For instance, an ordinance vesting the authority to recruit university teachers in the Public Service Commission of the State was issued some time ago by the Government of Madhya Pradesh. Mention may also be made of the order issued by the Government of Uttar Pradesh defining the qualifications of teachers to be appointed in the Universities of Allahabad and Lucknow, or the recent amendments carried out to its university Acts by the Government of Andhra Pradesh. We are, however, happy to note that the need for effective university autonomy as fundamental to a proper functioning of the universities is, on the whole, widely recognized in the country. In recent years, adverse legislation or orders have been either suitably modified or abandoned in view of the expression of public opinion and the advice given by the Inter-University Board and the UGC. The general trend is in the direction of acknowledging the proper sphere of university freedom and autonomy. We would like to stress that one of the most important functions of the UGC is to support and strengthen the autonomy of the universities and this role will become all the more important, difficult and delicate, as public funds spent on universities increase rapidly and inevitably in the years to come. The present serious difficulties of the UGC in the UK provide a pertinent and useful lesson for all countries which have a UGC-type of organization to pass on to the universities government funds but filter out government control.

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[1] Chapter V.

13.15. In this connection we would like to draw attention to two important points:

(1) As in the case of liberty, the price of autonomy is eternal vigilance by all parties concerned. The universities are established by law and they can have only as much autonomy as the law permits. In the last analysis, therefore, the real custodian of university autonomy is public opinion based on a conviction that autonomous universities, which maintain intellectual integrity in their fearless pursuit of truth, are an indispensable bulwark of democracy and freedom. In creating a strong public opinion in this behalf, the UGC, the IUB and the intelligentsia, who are themselves mostly the alumni of the universities, have an important role to play.

(2) The universities should also realize that it would be unwise to expect that effective autonomy could descend as a 'gift' from above: it has to be continually earned and deserved. The universities derive their right to autonomy from their dedication to the pursuit and service of truth. Their capacity to resist any illegitimate claims on their autonomy, therefore, will be proportional to their effective performance of this duty and their willing acknowledgement of the legitimate claims on them of the non-academic authorities. Moreover, as they discharge their intellectual and public obligations effectively and with integrity and contribute to the economic and social progress of the country, they will earn the esteem of society and government and the chances of their being confronted with illegitimate claims and pressures from outside will be diminished. This is not an easy task, quick of achievement, but this is emphatically the line along which we should move.[1]

UNIVERSITY FINANCES

13.16. University autonomy cannot become real and effective unless adequate provision is made to meet the financial requirements of universities and colleges. While the UGC has been established as an autonomous body to provide the necessary financial resources to the universities without governmental control or interference, State universities have to depend, for their maintenance grants and matching share, on the funds provided directly by the State Governments. This is an important source through which they can and sometimes do seek to curb the freedom of the universities. This is obviously undesirable. We recommend that the existing system of university finances should be reorganized on the basis of the following important principles:

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[1] At the end of the chapter, we give the statement on university autonomy issued recently by the IUB We fully agree with the views expressed therein.

— State Governments should deal with the universities with understanding and imagination and place adequate financial resources at their disposal to enable them to carry out their obligations in an efficient way. It would also be desirable if they seek the advice of the UGC in the matter.

— While some safeguards are inevitable in financial matters and reasonable economy in expenditure has to be ensured, it is essential to simplify rules and regulations and to operate them with speed and efficiency.

13.17. The Central universities obtain their grants—for maintenance as well as development—from the UGC. In their case, therefore, difficulties are reduced to the minimum and arise mainly from the inadequacy of available funds rather than through procedural deficiencies. Several difficult problems have, however, arisen with regard to the State universities, and it is these that we propose to discuss in some detail.

13.18. **Grants to State Universities from the UGC.** The State universities obtain their development grants mainly through the UGC. Under the Bill now before Parliament, the UGC will also be authorized to give maintenance grants to State universities in its discretion. We welcome this important reform.

13.19. At present, the UGC appoints visiting committees to assess the needs and requirements of the universities for developmental projects during a plan period and sanctions grants-in-aid on the basis of the recommendations made by the committees. This is a good procedure and should continue with certain necessary modifications which we shall discuss a little later. There is room, in our opinion, for expediting the sanction of grants—there are sometimes considerable delays as, for instance, when the All India Council for Technical Education (AICTE) has to be consulted—and for modifying the procedures for the release of funds. But these are, on the whole, of a minor character and we trust that they will be looked into.

13.20. For some schemes, the UGC gives grants-in-aid to State universities on a 100 per cent basis. But a majority of the schemes of development require matching grants from the State Governments. These are not often received in time. There is also a tendency on the part of some States to earmark funds for the setting up of new colleges and even new universities rather than to strengthen the standards of existing institutions. In view of these difficulties, it is sometimes suggested that the UGC should give grants on a 100 per cent basis only and that, if necessary, it may even reduce the number of schemes to be assisted. We do not favour this proposal which would have the disadvantage of reducing the total resources available for the development of university education. It may also possibly result in some State Governments taking less interest in higher education which is one of their important concerns. We are, therefore, of the view that there should be some sharing of developmental expenditure on universities between the UGC and the State Governments. But, in view of the financial difficulties which are being experienced by the State Governments, we are of the opinion that the share expected of them should be reduced to the extent possible.

13.21. Difficulties have arisen in some universities because the State Governments are not prepared to provide for the committed expenditure arising out of the developmental programmes undertaken by them with assistance from the UGC. In some cases, the State Governments have argued that they were not consulted when the developmental programmes were originally undertaken and that they are, therefore, under no obligation to provide for the committed expenditure involved. These problems have to be solved at an early date in the interest of higher education. We, therefore, recommend that the UGC should take early steps to mediate in the matter and save these universities from the embarassment caused by the non-payment of grants on committed expenditure by the State Governments.

13.22. **Grants-in-Aid to the State Universities from State Governments.** The State universities have to obtain grants from their State Governments for three purposes: (1) matching share on developmental grants given by the UGC; (2) non-plan grants for university development; and (3) grants for committed expenditure. The first of these is a small amount and we have recommended above that it may be reduced further. We trust that, in future, there will be no difficulty for the State Governments in making available promptly their matching share for development purposes.

13.23. The non-plan grant for university development as well as grants for committed expenditure, taken together, form a large amount and constitute the bulk of the total financial resources available to the universities. The existing procedures with regard to these grants are not satisfactory and because of them, most State universities are facing severe financial difficulties at present. With a view to making a closer study of the problem, the Commission addressed a questionnaire to all universities for information regarding the present systems of grant-in-aid and the difficulties encountered. The following are some of the main conclusions which have emerged from this study:

(1) There are two main systems of grant-in-aid from the State Governments to the universities: the deficit grant; and the block grant which may be statutory, *ad hoc* or based on the past expenditure (with or without an allowance for normal expansion).

(2) Under the system of deficit grants, the annual maintenance grant is given on the basis of the estimated approved expenditure *minus* the estimated approved income, subject to adjustment in subsequent years on the basis of actual income and actual expenditure as revealed by audited accounts. While this sounds unobjectionable on paper, it creates several problems in practice. For instance, the State Government may not convey the approval of its budget to the university in time. In fact, it is sometimes conveyed after six or seven months of the year have elapsed. Sometimes, sudden cuts are made in the budget which create serious difficulties for the university. Under such an arrangement, the university cannot create even a minor post or incur any recurring liability, however small, without the prior approval of the Government. The final adjustment of grants usually takes years to be completed.

(3) The system of block grant, on the whole, works better, although several problems arise in this method also. The two main ingredients of a block grant are: (a) the basis on which its amount is fixed; and (b) the frequency of revision. With regard to the first, three methods are in vogue. In the first, the amount of the grant is fixed on the basis of past expenditure. The main difficulty in this method is that it does not allow even for the normal growth of expenditure in a university. The practice prevailing in some States of allowing a cushion or an automatic increase at a specified percentage in the block grant is more helpful. But even here difficulties arise when unforseen decisions have to be taken (such as the revision of salaries or dearness allowance) during the period of the grant. With regard to the second, it is found that there are considerable variations in practice. When the amount of block grants is specified in the university Act itself and is made statutory, the system becomes inelastic, the grants remain fixed for years and the development of universities is retarded. The non-statutory block grants are revised sometimes triennially and sometimes quinquennially. But in a majority of cases, they remain unchanged for much longer periods.

13.24. For the smooth development of higher education, it is essential to review these practices and to institute a better system of grant-in-aid. This must satisfy three essential conditions: first, it is necessary to ensure that the grant-giving authority does not exercise too much control and rigidity of approach, as a system of checks and balances—devised in other days for other purposes—is out of tune with the needs of a rapidly developing university administration and finance; secondly, the grant receiving bodies have to exercise the utmost vigilance and economy in utilising public funds; thirdly, the system should be sufficiently elastic and should leave some scope to the universities to experiment with new ideas and projects. Thus a system of grant-in-aid has to be devised which would promote a free flow of funds from one authority to another and at the same time, ensure economy, efficiency and allow for the necessary degree of flexibility.

13.25. In the light of these general principles, we recommend that the system of grant-in-aid from the State Governments to the universities should be reorganized on the basis of a system of block grants providing for:

- fixation of a block grant for a short period, say 3 to 5 years, on a rolling basis;
- provision for inevitable increases of expenditure during the period of grant;
- payment of special grants during this period for unforeseen developments; and
- a 'cushion' to be left to the discretion of the universities so that they can have a fund on which they can

freely operate. One way of providing a part of this cushion would be to take into consideration only the 'standard' fees, the cushion consisting partly of the difference betwteen the standard and the actual fees. For the same purpose, we recommend that the interest on endowments should not be taken into consideration while fixing the grant.

The details of the scheme may be worked out by the State Governments in consultation with the universities concerned and the UGC. We understand that the principle of block grants has already been accepted in the case of Central universities and is working satisfactorily. This system could be the basis on which the State Governments work out their own formula.

13.26. University finances have to be considered as a whole and the distinction between the matching share on developmental expenditure, non-plan grants or grants for committed expenditure is purely notional and arbitrary. As it is urgent to place the finances of universities on a sound footing, the UGC should periodically review the finances of each university and give necessary advice in this matter to the State Governments as well as to the universities.

13.27. **Financial Accountability of Universities.** A question of considerable importance is the accountability of universities to the legislature as regards proper utilisation of public funds made available to them. The present position is that, leaving aside one or two universities, the universities' Acts require that accounts be audited by government auditors; but according to the present practice, they are not placed before Parliament in the case of Central universities or State legislatures in the case of State universities. The Public Accounts Committee of Parliament has from time to time expressed the view that this arrangement is not satisfactory. In its 42nd (1961-62) Report, it has observed that while the Committee is anxious to preserve the financial autonomy of the Central universities, it is unable to share the apprehension that presentation of these audited reports to Parliament would infringe on their financial autonomy or result in making their financial affairs a matter of public controversy. The Committee has urged that early steps should be taken by the Government to present these reports to Parliament and that provision to this effect be made in the statutes.

13.28. We have given careful thought to this matter. It is our view that universities should not only be immune from direct governmental intervention but also from *direct* public accountability. In the interest of the autonomy of the universities, their financial affairs should not be made either a subject of public controversy or an issue in party politics which is likely to be the case if they are placed before Parliament. Secondly, control over universities should be indirect and in keeping with their position in the national life. In the UK, a closer control of capital expenditure in the universities by Parliament has been the subject of long discussion, but the government has maintained that such control would be detrimental to the independence of the universities.

13.29. There exists a provision in the Acts of Central universities that their audited accounts should be published in the Gazette of India and presented to the Visitor along with the audit report. This procedure gives the Government the necessary opportunity for exercising such corrective and supervisory control over these universities on behalf of the Visitor as is needed, without unduly interfering with their fiscal and administrative freedom. A similar procedure could be adopted for the State universities where it does not already exist.

13.30. The accounts of the universities are generally audited by the Comptroller and Auditor-General who can bring significant points to the notice of the legislature. However, as a safeguard, a specific direction could be given to him that, wherever necessary, serious irregularities in the accounts of the universities should be brought to the notice of the legislature.

13.31. The matter is a complex one and has some far-reaching implications. It is still under the consideration of the Government and the Public Accounts Committee. It will be relevant to reproduce at some length the observations made by the Committee on Higher Education in the United Kingdom in this matter:

> We now come to a point of some technicality that has a considerable bearing on academic freedom.

> The terms of the Vote under which moneys are provided for the universities and colleges state that grants to institutions will be made on the recommendation of the University Grants Committee; and convention has established that the Treasury does not inquire into or question the Committee's recommendations as to the allocation between universities of the total amounts on which the Government has decided. Again, the Comptroller and Auditor General has not had access to the books of the universities and the University Grants Committee. No doubt having in mind the large proportion of current expenditure represented by academic salaries, which follow prescribed scales, the Public Accounts Committee has hitherto been satisfied that the methods of control of recurrent grants are a reasonable compromise between the need to maintain university independence and the exercise of financial control by the Government and Parliament. But the closer control of capital expenditure was for long the subject of discussion between the Public Accounts Committee and the Treasury, the former claiming the right of scrutiny, the latter arguing that it would be inimical to the independence of the universities. In recent years, however, procedures have been introduced whereby, without the Treasury or scrutiny from the officers of the Comptroller and Auditor-General, it has been possible to satisfy the Public Accounts Committee that there exist due safeguards against improper or wasteful expenditure, a notable victory for the good sense and moderation of all the parties concerned.
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> We attach great importance to this immunity and we are glad the Treasury has successfully upheld it. We yield to no one in our condemnation of extravagance in the use of public money and the absence of proper accounting, and we think it perfectly proper that the Grants Committee should have the right to adopt such safeguards as are necessary to prevent abuses of this kind. But unless full confidence is placed in the Committee, rather than in a ministerial department, to exercise these functions, an important part at least of its value as a buffer disappears, and the way is open to intervention by the Government and Parliament in the work of the universities. Our travels abroad have convinced us more than ever of the immense value of the British system whereby detailed public justification of particular university expenditure is not required. It was the Rector of one of the most famous universities in Western Europe who said, when describing to us the system under which he worked, so long as we are subject to these controls as regards finance, all talk of academic freedom is a swindle'. We recommend, therefore, that, irrespective of any changes in ministerial responsibility, present policy on accountability should continue.
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> There will remain matters of broad policy on higher education that must be the concern of the Government and of Parliament, and it is the great advantage of the Grants Committee principle that in all such matters the views and advice of the Government and universities can be mutually brought to bear without detailed scrutiny of the expenditure of particular institutions. This, as experience elsewhere shows, is incompatible with that free initiative and full responsibility that it is in the national interest to preserve[1].

ROLE AND APPOINTMENT OF THE VICE-CHANCELLOR

13.32. The person who is expected, above all, to embody the spirit of academic freedom and the principles of good management in a university is the vice-chancellor. He stands for the commitment of the university to scholarship and pursuit of truth and can ensure that the executive wing of the university is used to assist the academic community in all its activities. His selection should, therefore, be governed by this overall consideration.

13.33. The University Education Commission (1948-49) gave considerable thought to the question of the selection of vice-chancellors. It rejected the proposal that the selection be taken out of the university's hands on the ground that if the university is responsible for the appointment of the vice-chancellor, he will find it easier to gain the esteem and confidence of the academic community. The Commission observed that it is really a part of a university's duty to learn how to choose its own vice-chancellor wisely and that, therefore, to deprive it of this duty would be a counsel of despair'. The Commission recommended that the Chancellor should appoint the vice-chancellor upon the recommendation of the Executive Council which should submit one name only to him. He may, of course, refer the name back if he considers it unsuitable, but should not initiate the appointment himself.

13.34. Taking a long-term view of the matter, we agree with this recommendation and suggest that as the necessary conditions are created, the choice of the vice-chancellor should eventually be left to the university concerned. But in view of the present situation in many of our universities, we recommend, for the time being, the adoption of what is called the 'Delhi pattern'—or some suitable variation of it. According to this pattern, the appointment is made by the Visitor from a panel of three names prepared by a committee consisting of three persons, two of whom are nominated by the Executive Council from amongst persons not connected with the university or any of its colleges, and the third is nominated by the Visitor who also appoints one of them as chairman of the committee. There is no need, however, to prescribe a single pattern for the constitution of this committee. In the University of Rajasthan, for instance, the committee consists of a nominee of the university, a nominee of the Chancellor and a nominee of the Chairman, UGC. There are, however, two important principles which must be observed. The first is that at least one of the members of the committee should be a representative of the Executive Council of the university. In this regard, we do not favour the existing restriction that the representative of the university should not be connected with it in any way and recommend that it may be annulled, except for paid employees of the university. The second is that all members of the committee should be known for their eminence and integrity to ensure that the selection would not be open to pressures, 'backdoor influences' or other forms of canvassing which are likely to vitiate it and which can lead to many evils and the growth of cliques in the university. We also suggest that the selection committee should informally consult the university to ascertain its special needs and pay due regard to them. Incidentally, it should obtain the informal consent of the persons to be considered for inclusion in the panel of names for the vice-chancellorship before submitting them to the Chancellor.

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[1] *Report of the Committee on Higher Education, U.K.*, H.M.S.O., London, 1963, paragraphs 752—756.

13.35. The suggestion has sometimes been put forward that vice-chancellors in the universities should be appointed by rotation from among the deans for a period of two years or so. We do not endorse this suggestion as, apart from other things, it will preclude selection on an all-India basis and lead to a certain undesirable inbreeding. But it may be followed in the appointments of pro-vice-chancellors or rectors where the posts exist. The vice-chancellor should, however, have the authority *not* to recommend the name of a person unsuitable for this purpose.

13.36. The Committee on 'Model Act for Universities' has recommended that the first vice-chancellor of a new university should be appointed by the Visitor/Chancellor or Government. A lacuna in this rule is that if the first vice-chancellor resigns or dies shortly after the appointment, the Visitor/Chancellor cannot make the second appointment even though it is needed in the interests of the university. We, therefore, suggest that the authority to appoint the vice-chancellor during the first five years of a university's life should vest in the Visitor/Chancellor.

13.37. Whatever be the mode of appointment of the vice-chancellor, its main object is to choose the best person available and to grant him suitable conditions of service so that he may function without fear or favour of persons in authority. Generally, the vice-chancellor should be a distinguished educationist or eminent scholar in any of the disciplines or professions, with a high standing in his field and adequate administrative experience. We are not generally in favour of appointment of persons who have retired from other fields. An exception to this general recommendation should be made only in the case of very outstanding persons whose association with the universities would be desirable from every point of view and should not be made an excuse for 'accommodating' or 'rewarding' individuals who do not fulfil the conditions laid down.

13.38. The term of office of the vice-chancellor should be five years and he should not normally be appointed for more than two terms in the same university. The vice-chancellor's appointment is a full-time one: he is the chief executive and academic head of the university and his duties and responsibilities are onerous and demanding. They call for continuous initiative, personal contacts and leadership. We, therefore, recommend that the old system of appointing honorary vice-chancellors should be discontinued and that all posts of vice-chancellors should be full-time salaried appointments. Also, the conditions of service, and availability of pre-requisites, should not be *qualitatively* different from what apply to professors and other staff of the university. For instance, we are not in favour of providing free house, free electricity and water, and so on. A furnished house—furnished not extravagantly but according to standards appropriate to the academic community—should be provided by the university, but a rent should be charged at the usual rates. We also recommend that the retirement age for vice-chancellors should be fixed at 65 years.[1] In the case of exceptionally qualified persons of all-India eminence, an exception may be made from the operation of this rule. But such exceptions should be very few indeed and patently justifiable and not be made, we repeat, to 'accommodate' retired officials or politicians or other 'dignitaries'. When the appointment of vice-chancellors becomes a matter of prestige and power politics, the battle may well be taken as lost.

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[1] It is of interest to note that the Franks Commission on the University of Oxford has recommended that the term of a vice-chancellor should be four years and that he should be below 61 years of age at the time of appointment.

13.39. The universities in our country are passing through a stage of rapid development. In view of this, and also because of the very special position which the vice-chancellor occupies in the life and work of the university, it would be an advantage if his successor can be designated in advance by a year or so. It will mean that the procedure for selecting the vice-chancellor will have to be put into operation sufficiently ahead of the term of expiry of the vice-chancellor in position. This will provide the vice-chancellor-designate an opportunity to get broadly acquainted with the conditions in and the development plans and policies of the university.

13.40. One of the major weaknesses in the existing university Acts is that the vice-chancellor does not have sufficient powers vested in him. In some Acts, powers are delegated to him by the Executive Council; but in others there is no such provision. We agree with the Model Act Committee that adequate powers (*e.g.*, for disciplinary action involving students) should be vested in him for the efficient working of the university. The university Acts should also contain a definite provision for the delegation of powers to the vice-chancellor by the Executive Council.

LEGISLATION FOR UNIVERSITIES

13.41. The nature of university legislation reacts on the efficiency and elasticity of university administration. The Report of the Model Act Committee deals with some of the problems arising out of it and it is neither possible nor necessary for us to go in detail over its proposals. We shall only draw attention to the important authorities of the university, *viz.*, the Court, the Executive Council, and the Academic Council. We have already referred to the Joint Departmental Committees to which we attach great importance. We shall also discuss the establishment of a new authority which is needed, *viz.*, the Academic Planning Board.

13.42. **The Court.** The Court should be the policy making body of the university with a lay element and should not be concerned with the details of academic matters or the day to day administration of the university. It should consist of not more than 100 members, of whom about half should be external. They will include ex-officio members, representatives of alumni, learned professions and industry and nominees of the Executive Council, the Visitor and the Court. As we have recommended earlier, representatives of the students may also be included. It may also be useful to have representatives of the Corporation or Municipality in whose jurisdiction the university is situated. There is no need to give representation to other local bodies; but when the district school boards proposed by us have been constituted, their representatives should be included. Representation should be given to the Parliament in the case of Central universities and to the State legislature in the case of State universities. We would, however, suggest that the acts of universities should only provide for the total membership of the Court or the Senate while its detailed composition may be provided in the Statutes. This will enable the universities to change the composition of the Court in the light of experience and requirements without going through elaborate legislative procedures.

13.43. **The Executive Council.** The Executive Council, as recommended by the Model Act Committee, should consist of 15-20 members, about half being internal and half external. The vice-chancellor should be its chairman and the pro-vice-chancellor or rector of the university, an ex-officio member. For instance, it may have four deans of faculties who should be full-time teachers, four principals of colleges, three persons elected by the Court from amongst its members, three teachers of the university elected by themselves and four persons nominated by the Visitor and/or Chancellor who may include representatives of the Government.

13.44. **The Academic Council.** The Academic Council should be the sole authority for determining the courses of study and standards. Their decisions should not need approval by any other authority in the university. According to the acts of the universities, the Senate or the Court has very little authority for interfering in academic matters. But, the power of the Academic Council to make the necessary regulations is affected in two ways: first, resolutions concerning academic matters are sometimes passed in the Executive Council in the first instance so that they become binding on the Academic Council; secondly, as the Acedemic Council meets urgent twice a year in most universities, urgent matters are often taken up by the Executive Council. To obviate such difficulties, it will be necessary either to have more frequent meetings or constitute a Standing Committee of the Academic Council to deal with such matters. As we have recommended earlier, student representatives may also be associated with the Academic Council.

13.45. **Academic Planning Boards.** There is need in the universities for a permanent planning and evaluation machinery detached from the day-to-day administration. We recommend the appointment of Academic Planning Boards for this purpose, consisting of the representatives of the university, along with some persons from other universities and a few distinguished and experienced persons in public life. These should be appointed by the Chancellor in consultation with the vice-chancellor. They should be responsible for advising the university on its long-term plans and for generating new ideas and new programmes and for periodic evaluations of the work of the university.

13.46. **Convocations.** We would like to make a comment on the convocation functions in our universities and colleges, as at present organized. The degrees are conferred on students *en masse* and provide little sense of real participation to them and do not, therefore, serve much useful purpose. A reform in its ritual and procedure appears to be necessary. The IUB would do well to appoint a committee to go into the various aspects of this matter including the question of academic dress. The hood and gown are inconvenient and even incongruous in the Indian setting and climate. We note that many countries *e.g.*, the USSR and Japan, do not require any particular academic dress to be worn by new graduates receiving degrees at a convocation.

13.47. We regret to note that, on two occasions in recent years, university constitutions were suspended by Government. It is our considered view that the suspension of the constitution of a university is an extreme step and should not be taken unless every other instrument of reform has been tried and failed. We do realise that universities are sometimes unable to measure up to expected standards of achievement. The solution to such situations should, however, be found by providing a built-in device in the university system itself to deal with serious malpractices or maladies. In so far as Central universities are concerned, the President of India, who is the Visitor of the Central universities, has the powers to direct inspection of or inquiry into the affairs of a Central university. With regard to State universities, this authority is vested directly in the State Government. This is not a happy situation and we agree with the Model Act Committee that the Governors of States should be the Visitors of all universities in the State and should have similar powers. We also recommend that a convention should be built up to the effect that before exercising their powers in this regard, the Visitors should consult the UGC.

13.48. **General Recommendations.** Most of the existing university legislation in India needs to be amended in accordance with the broad principles enunciated above. We make the following proposals in this connection:

(1) The existing legislation for all universities should be reviewed and amended in the light of our recommendations. The Education Ministry and the UGC should take the initiative in this matter. The same principles should also be adopted for all new legislation on the subject.

(2) A certain amount of variety in the pattern and organization of universities is desirable in the interests of the development and progress of higher education in the country. The recommendations of the Model Act Committee deal with only the most important aspects of the organization of a university and even here alternatives are sometimes suggested, so as to make it possible to preserve the practices and traditions which have been found satisfactory in any existing university. As the committee stresses, it is necessary that the constitution of a university should be formulated in sufficiently general terms so as to leave room for and promote innovation and experimentation.

(3) It is necessary to evolve a suitable machinery for tripartite consultations between the UGC, the Ministry of Education and the State

> Governments before legislation relating to universities in enacted. This should take place before bills relating to university education are finalized. Similarly, the Central Government while passing legislation should give an opportunity to the State Governments to express their views. This procedure would avoid many difficulties of the type which have recently arisen and would help the smooth development of higher education in the country.

In this connection, we would like to endorse the following observations of the Model Act Committee: 'Constitutions by themselves cannot ensure a good organization, and written constitutions need the support of good conventions. While the Committee is offering certain suggestions as guides for improving and modifying the organizational pattern, it is convinced that the proper functioning of a university depends on the all-round acceptance of two basic principles. These are autonomy for universities from external control together with a democratic administrative system, and effective participation of the academic community in the formation and implementation of university policy and programmes'.[1]

13.49. **Universities and the Law Courts.** Our attention was drawn to the increasing number of law suits filed against the universities and we examined this problem in collaboration with the Indian Law Institute, New Delhi. The study of the information supplied by the universities and the reported decisions of the High Courts and the Supreme Court reveal the following trends:

(1) The considerable increase in the number of law suits filed against the universities in recent years is mainly due to a change in social attitudes. In the past, one avoided going to a court of law as far as possible, but now the pendulum seems to have swung to the other extreme. A student who is punished for violating the university rules and discipline or is found copying in the examination takes recourse to a law court almost as his first choice; so does a teacher who is sought to be removed from service for working against the interests of the university or for a serious neglect of his duties.

(2) In a large majority of cases, the decision of the courts has gone in favour of the universities. In the case of one university, we found that out of 64 writs issued, only 4 were decided against it. In spite of this ultimate judgment in their favour, the stay orders and other preliminary proceedings which the courts have inevitably to take in such cases have generally involved expenditure of time and money and proved irksome to the university authorities.

(3) Except in a few cases, the tendency of the courts has been to leave 'matters connected with education' to be regulated by the educational institutions themselves, **unless there is a *prima facie* miscarriage of** justice or *mala fide* is proved. Admissions, examinations, discipline of students, and the regulation and maintenance of teaching and non-teaching staff have been regarded as instances of 'matters connected with education'[2]. The Supreme Court has also held that the administration of educational institutions cannot be equated with that of an industry and that the principles governing settlement of industrial disputes should not be extended to educational institutions (University of Delhi vs. Ram Nath A.I.R. 1963).

13.50. This is a very difficult problem to which there is no easy solution. We would, however, make two main recommendations which may facilitate matters:

(1) The educational system should strive to give a proper value-orientation to education and to create the essential atmosphere necessary to transform all educational institutions into communities of teachers and students. Moreover, steps should be taken to make the administration of educational institutions as democratic as possible by associating the teachers and the students with it so that the grievances of individuals could be satisfactorily settled in most cases within the system itself and the temptation to go to courts of law would be minimised.

(2) We further suggest that the Government of India may approach the Supreme Court with a request to review the trends seen in the recent decisions of the courts in cases relating to universities and educational institutions and to consider the desirability of framing a suitable policy in this behalf which would help the maintenance of

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[1] *Report of the Committee on Model Act for Universities*, Ministry of Education, Government of India, New Delhi 1964 p. 8.

[2] See Supplementary Volume I, Part IV, for a digest of reported cases in th High Courts and the Supreme Court

university autonomy and the development of higher education.

13.51. It may be mentioned in this connection that the question whether the decision of a university passing or failing a candidate in an examination is justiciable in a law court was recently considered by the Privy Council in the U.K. The Council has ruled that the courts have no powers to adjudicate in such matters. In another case (Thomson vs. University of London) it was decided that regulations and disputes as to the holding of the examinations and the granting of degrees were matters exclusively within the jurisdiction of the Visitor of the University. It would be in the interest of the proper functioning of our universities if similar healthy conventions are clearly established in the country.

AFFILIATED COLLEGES

13.52. **Affiliation.** It is part of the function of the universities to affiliate colleges and confer degrees on their students. Under the practices now in force, each university lays down the conditions for affiliation, sends out teams of inspection and grants affiliation on the basis of their reports.

13.53. In granting affiliation to a college, both the university and the State Government are concerned—the university from the academic point of view and the State Government, which is required to give grant-in-aid, from the financial point of view. At present, the mutual relationship between the universities and the State Governments in this matter is not clearly defined. In some States, affiliation is granted by the universities without reference to the State Government. In some others, affiliation is a joint affair and is finally granted by the State Government on the recommendation of the university concerned. Moreover, the State Governments which give grant-in-aid to affiliated colleges do not consult the universities in preparing the rules of grant-in-aid or in sanctioning it. It is obvious that these two functions—affiliation and grant-in-aid are inter-dependent and that the effective control of colleges is weakened by their separation. We make the following recommendations to improve the present situation:

(1) **Affiliation of colleges in an academic matter and should be granted by the universities. But since each affiliation creates eligibility for aid, they should consult the State Government, in respect of all private colleges, before a final decision is taken.**

(2) In granting affiliation for the first time, mention should be made not only of the time for which it is granted but also of the courses and the maximum number of students to be admitted to the college. In the admission of science students, etc., the total number to be admitted to each course should be specified. When affiliation is granted subject to certain conditions, there should be a vigilant watch to see that they have been actually and properly fulfilled. Laxity in this behalf has often led to substandard colleges being affiliated, thus depressing standards.

(3) The State Governments should involve the universities more intimately with the operation of the grant-in-aid system to colleges. It would be desirable to have an informal committee consisting of all the vice-chancellors in the State to advise the Education Department regarding grant-in-aid to affiliated colleges. The committee should be consulted on formulation of grant-in-aid rules or modifications therein and the annual allocations of grant-in-aid. The work of this committee would be of great help both to the Department and to the universities.

13.54. **Council of Affiliated Colleges.** We recommend that there should be a Council of Affiliated Colleges in every affiliating university, consisting of the representatives of the university and the colleges. It may also be advisable to associate with it as members, a few representatives of other universities in the State and from outside. The functions of the Council, to be laid down by the Statutes of the University, would be to advise the university on all matters relating to affiliation of colleges, to help in the implementation of the policy of the university in this matter, to keep a close contact with the colleges with a view to help in their proper development, and to evaluate periodically whether the standards of colleges are being steadily raised. This is by no means an easy assignment and it can be discharged satisfactorily only if members with a high sense of duty and keen understanding of educational problems are selected.

13.55. It is also necessary to strengthen the existing machinery for the grant of affiliation to colleges and for their periodical inspection. A number of measures can be taken for this purpose.

(1) The conditions for affiliation prescribed by the universities should be reviewed

and improved broadly on the line recommended by the Conference of Principals of Colleges convened by the UGC in May 1964. We would like to emphasize that the primary responsibility for maintaining standards in higher education is on the universities, and unless they show a serious concern for the quality of education, very little can be done to improve the situation.

(2) Affiliation should be regarded as a privilege which is to be continuously earned and deserved. It is, therefore, necessary to arrange for periodical inspection of all colleges, preferably once every three years, with a view to ensuring that proper standards are maintained. It has been brought to our notice that this periodical inspection of colleges is not always carried out. One of the main difficulties, especially felt by the universities which have large numbers of affiliated colleges, is that there is no permanent staff for such inspection, that it is very difficult to get together a group of suitable teachers on an honorary basis to constitute the inspection committees and that this difficulty becomes greater when persons from outside the university are to be associated with them, as is obviously desirable. We do not think it would be advisable to entrust the periodical inspection entirely to a whole-time paid staff. It is always necessary to associate eminent university and college teachers with them in an honorary capacity. We are of the opinion, however, that the existence of a small nucleus staff for the purpose will greatly assist in the proper organization of this programme. We recommend that this matter may be examined by the UGC.

13.56. While every effort should be made to strengthen the existing machinery for affiliation of colleges and for their periodical inspection, it would be a mistake to oversimplify the problem and to imagine that this reform by itself would be able to improve their standards. We would like to point out that the reasons which lead to a multiplication of weak colleges are varied and complex and go deep into the socio-economic structure of our society. For instance, such institutions mainly arise from

- the rapid expansion of higher education due to various socio-economic factors already discussed in Chapter V;
- the inability of Government to provide the resources needed to make adequate provision for this expansion;
- the social and political pressures that operate within the university system itself; and
- the political pressures arising outside the university system and which the universities are often unable to resist.

It has to be realized that the basic reform which alone will make it possible to improve standards in affiliated colleges is to relate enrolments to the facilities available. Neither the colleges, nor the universities, not even the UGC determine solely the policies regarding expansion. These have to be mainly determined by the Central and State Governments in view of the total requirement of trained manpower for national needs and in relation to the plans for the development of agriculture, industry or other sectors of national life. Once these decisions have been taken, it becomes their responsibility to provide the needed resources. What is happening at present is that while expansion is allowed to continue at about 10 per cent per year, the resources provided for this purpose, in real terms, are not even half as much. This cannot but lead to a progressive deterioration in standards and no administrative reform in the machinery of affiliation can cure this basic weakness of educational policy.

13.57. **Government Colleges.** One of the important responsibilities of the State Education Departments is to manage Government colleges. The University Education Commission recommended that Government should not conduct any colleges and that all government colleges should be transferred to the universities. This recommendation has not found general acceptance and even where it was accepted, the results have not always been satisfactory. The most successful instances are probably those of government colleges situated at the headquarters of universities which have been transferred to their management and converted into constituent colleges or departments. A wholesale transfer of all government colleges to the control of the university was made only in one State, Mysore, but the experience was so discouraging that they had to be retransferred to Government. By and large, there is a definite feeling that State Governments should not normally conduct any colleges. At the same time, the transfer of government colleges to universities is opposed by some persons on the ground that it does not help the colleges and burdens the universities with administrative responsibilities that interfere with their development. It is, therefore, desirable that some suitable agency be devised for the management of such colleges.

13.58. We have examined the point carefully and find that it is not advisable to recommend a single solution which would apply to all cases. There is need to try different approaches to suit local conditions and traditions. We would like to make the following recommendations in this regard.

(1) In States like Madhya Pradesh or Rajasthan, there is a large number of government colleges run by a separate Directorate of Collegiate Education. While this practice may continue, it should be ensured that the Director of Collegiate Education is an educationist of standing. Attempts should be made to eliminate such defects as frequent transfers of staff.

(2) The possibility of setting up an autonomous organization to manage all the government colleges in a State may also be explored. This organization as we envisage it, will have a Governing Board with a whole-time secretary. All the vice-chancellors of the universities in the State should be members of the Governing Board, along with some representatives of Government and some non-official educationists and university teachers. Such an organization is likely to make the administration of colleges less amenable to political influences and considerations, and give it a more academic orientation. It will also incidentally get over the difficulty under which the staff of government colleges (who belong to the State service) cannot be given the scales of pay sanctioned by the UGC.

(3) An alternative possibility is the practice adopted in Delhi where each Government college has been placed under an autonomous Board of Governors. This has the advantage of localising the staff and enabling it to develop loyalty to their institutions.

13.59. **Private Colleges.** Private colleges form the vast bulk of affiliated colleges and unless they are properly directed and given adequate assistance, the general standards in higher education would not improve. We think that a major change is needed in the present policy which treats all private institutions alike for purposes of control as well as for grant-in-aid. This should be replaced by a discriminating pattern under which the really good institutions are given greater freedom and more liberal assistance while a firm policy of direction s adopted towards weaker institutions which do not deserve larger grants because they fail to make any attempt at self-improvement.

13.60. The procedure for calculation and payment of grants-in-aid should be simplified.

(1) The grant-in-aid for non-recurring expenditure generally presents no problems. It would, however, be desirable to treat the certified reasonable rent on buildings constructed out of voluntary contributions and without State assistance as approved recurring expenditure for purposes of grant-in-aid. This would encourage raising of funds for capital expenditure.

(2) With regard to the recurring expenditure, it would be desirable to divide the total expenditure incurred into two parts: teacher costs and non-teacher costs. The former, which would include salaries, allowances, and old-age benefits payable to the teaching staff, can be easily determined on the basis of parity with government colleges or in accordance with the rules made by the university. Difficulties arise most frequently with regard to the non-teacher costs. These can be avoided by prescribing a minimum expenditure to be incurred as well as the maximum permissible to a college, preferably as a proportion of the total expenditure on teacher costs. Within these two limits, the college should be left with full freedom to utilise the resources available in the best manner possible.

(3) The fees to be levied in all colleges should be prescribed by the universities in consultation with the State Government. What should be prescribed are 'standard' fee-rates (and also the proportion of free studentships) and it is only on this basis that the fee-income of the college should be calculated for purposes of grant-in-aid. But the institution should have the freedom to levy higher fees, with the approval of the university, subject to a prescribed upper limit—say, twice the rate of standard fees. The additional income thus received should be at the disposal of the institution to be spent on providing additional facilities for the students and the staff but not used for meeting the contribution which the management is required to make. The college should submit an audited statement of accounts for these funds to satisfy the authorities concerned that there has been no mis-

application of funds. This would provide the essential cushion to ensure freedom and elasticity needed for development.

(4) The total grant-in-aid payable should be equal to:

— all teacher costs;

—*plus* non-teacher costs actually incurred or the ceiling prescribed for the purpose, whichever is less;

—*minus* the contribution by the management which will have to be met from its own sources and not from fees; and

—*minus* the income collected at the standard fee rates, after allowing for the prescribed free-studentships.

The contribution by the college management would vary from State to State and area to area. The rate of contribution should also be revised every five years, the amount to be fixed by the State Governments in consultation with the universities concerned. The standard fee rates as also the ceiling for non-teacher costs should be determined in the same way. We are of the view that, by and large, the management of a college should be expected to provide an endowment of Rs. 500,000 and, until that becomes possible, to make a contribution equivalent to the interest thereon.

COORDINATION AND PROMOTIONAL MACHINERY

13.61. We come now to the agencies charged with overall promotion and coordination in higher education. The two main agencies for the purpose are the Inter-University Board and the University Grants Commission and we shall examine in turn their functioning and what reforms may usefully be proposed.

13.62. **The Inter-University Board.** The IUB was set up by a resolution adopted at the First Conference of the Vice-Chancellors of Universities held in Simla in May 1924. At the time of its inception, India, Ceylon and Burma were its members. According to the available information, 47 Indian universities, 2 universities in Ceylon and 5 Indian institutes of technology are members of the Board at present. Besides these, three institutions 'deemed to be universities, are its associate members.

13.63. The IUB provides a useful forum for exchange of views among vice-chancellors and discussion of common problems. The Board has also helped to enforce some standards and code of conduct among the universities. It is a useful channel through which the Government and the UGC can ascertain the opinion of universities on important problems. It plays the important role of representing university opinion to Government and the public. The United Kingdom Committee of Vice-Chancellors (which corresponds to this Board to some extent) defines this latter function as follows, which is also applicable to the Indian situation: 'Apart from the initiative it takes in making recommendations regarding a common policy on matters of internal concern to the universities, it is the channel through which the University Grants Committee and the Ministries which have contacts with the universities can ascertain the reaction of university opinion to proposals they have in mind or to problems they would like to discuss. Equally, the Vice-Chancellors' Committee may itself approach the UGC or other bodies on matters of concern to the universities generally.'

13.64. In our opinion, the work of the IUB on the above lines would be strengthened and made more effective if its membership is made automatic to include all statutory universities and all institutions deemed to be universities under the UGC Act. At present, it is open to the Board to admit or not to admit any university to its membership and it is also open to a university to apply or not to apply for membership. Consequently, a number of universities in India are not members of the Board at present, which, in our view, only weakens its position. We, therefore, recommend that all statutory or deemed universities should become members of the Board automatically.

13.65. At present, each university has to give equivalence separately for each degree or diploma given by every other university and one of the functions of the IUB is 'to assist Indian universities in obtaining recognition for their degrees, diplomas and examinations in other universities'. We see no real justification for the Board undertaking this function. It involves considerable delays and hardships, especially when even brilliant students fail to get admission to certain universities for the simple reason that their degree has not been recognized. We recommend that the degrees or diplomas granted by a statutory or deemed university in India should receive automatic recognition from all other statutory or deemed universities. We may also point out that such recognition only confers 'eligibility' and does not in any way interfere with the right of admission. The good offices of the Board should in future be utilised only to secure recognition by foreign universities of the degrees, diplomas and examinations of Indian universities.

13.66. We visualize considerable increase in the functions of the IUB. Even now it acts as a clearing house of information on university affairs and is the central agency for organizing inter-university sports. These responsibilities will continue and should be expanded. It should also be possible for the Board to develop certain advisory, research and service functions for and on behalf of the universities. In order to carry them out, the Board should be strengthened financially and enabled to maintain an adequate secretariat.

13.67. **The University Grants Commission.** On the recommendation of the University Education Commission, the UGC was established under an Act of Parliament in 1956. Its working has been recently reviewed by the Committee of Members of Parliament on Higher Education. In our opinion, it has had a creditable record of work during the first ten years of its existence.

13.68. As at present organized, higher education is divided into a number of sectors and compartments with little communication and interaction between them. The UGC deals with about sixty universities and pays them development grants out of funds placed at its disposal by the Government of India. Besides these, there are agricultural universities drawing their inspiration from the concept of the U.S. land-grant colleges, which, in the last century, made an important contribution to American professional education and farm productivity. The special feature of the agricultural universities is the stress that is laid on combining agricultural education, extension and research. These universities have also established departments in natural and social sciences to support agricultural education and research. There are also the institutes of technology at Kharagpur, Kanpur, Delhi, Bombay and Madras which, under an Act of Parliament, have the status of 'institutions of national importance' and enjoy the power to confer degrees. Assistance from the Central funds to agricultural universities, as also to the IITs, is not channelled through the UGC but provided by the Ministry of Agriculture and the Ministry of Education respectively. Central assistance for medical education is given by the Ministry of Health. It may also be mentioned that teacher education is the responsibility of the universities only in a limited measure. This fragmentation unaccompanied by any effort at effective coordination is a serious weakness in our present pattern of higher education.

13.69. In our opinion, the UGC should represent the entire spectrum of higher education. It should be professionally concerned and adequately equipped to deal with all its problems. This is necessary for various reasons but principally because, in the contemporary world, no discipline can develop fully in isolation from the main stream of academic life. Agriculture, technology, medical sciences and teaching will all be the richer for being part of this broad stream and by being concerned with the problems and needs of one another. This applies most directly to teaching, but will apply more and more to research also. The real break-throughs in the future will most likely be made at the frontiers where different disciplines meet. It may also be incidentally pointed out that this position is in consonance with the existing Act of the UGC which is designed to embrace all branches of higher education. We, therefore, fully support the recommendation of the Committee of the Members of the Parliament on Higher Education that all higher education should be regarded as an integrated whole, that professional education cannot be completely divorced from general education, and that it is essential to bring all higher education, including agriculture, engineering and medicine, within the purview of the UGC. This is the ultimate direction in which we should move.[1]

13.70. We have examined this problem in all its aspects and have come to the conclusion that, although it is a desirable long-term goal, it will not be possible to take this step immediately and that, for the time being, it would be more feasible to set up separate UGC-type organizations for agricultural, engineering and medical education and to create a machinery that would effectively coordinate them. Our proposals for immediate action, therefore, are as follows:

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[1] This was also the view of the University Education Commission

(1) It is not desirable that Government should deal direct with the universities. It is always a great advantage to interpose, between the Government and the universities, a committee of persons selected for their knowledge and standing rather than for their political affiliation or official status. Such a device ensures the necessary coordination between Government and the universities, allocates Government grants to institutions of higher education on the basis of their carefully assessed needs and yet insulates them from inappropriate political influences. As the Report of the Committee on Higher Education in the UK has pointed out, 'The Government is thus advised by a body which though appointed by Government, is independent of ministerial and departmental control and is composed chiefly of persons with intimate knowledge of university life and its conventions. This immunity from direct ministerial intervention is further strengthened by immunity from the normal application of public accountability......Thus individual universities are very largely insulated from direct intervention by the Government or Parliament in the detailed ordering of their affairs.'[1]

(2) UGC-type organizations, based on the above principle, should be set up for dealing with technical, agricultural and medical education. They need not necessarily be set up by law and our purpose will be served if they are established as autonomous organizations. They should be composed of teachers and scientists of eminence in their fields and should be small and compact bodies so that they can meet frequently and work expeditiously. The head of such an organization should himself be a scholar or scientist of repute in the field. They should function more or less like the UGC, *i.e.*, lump-sum grants should be placed at their disposal by the Ministries concerned and they should have the freedom to distribute them to the universities in relation to their needs and programmes of development.

(3) For purposes of co-ordination, there should be a certain overlapping membership between the UGC and the UGC-type organizations recommended above. In addition, the chairmen of all these four bodies should meet periodically to review and coordinate their programmes.

13.71. The Committee of Members of Parliament on Higher Education had expressed the view that it would be undesirable to appoint a person, who is holding a full-time appointment as vice-chancellor as a member of the UGC. This proposal has been accepted by Government and the necessary changes are being made in the UGC Act. We are unable to agree with this view and are of the opinion that the UGC should not be deprived of the services of an eminent person merely on the ground that he happens to be a vice-chancellor. In our view, the UGC should consist of 12—15 members. Of these, not more than one-third should be officials of Government. At least one-third should be from the universities and we would not rule out a vice-chancellor being included. The remaining should be eminent educationists. In order to provide a greater degree of rotation, we recommend that the term of office of members may be reduced from the present six to three years with not more than one extension.

13.72. It will be advisable for the UGC to adopt a practice of working through a number of standing committees set up to deal with important responsibilities entrusted to it. For example, there may be standing committees on affiliated colleges, teacher education, including the training and orientation of university teachers, preparation of university textbooks and development of literature in modern Indian languages, and student welfare, including scholarships. Each standing committee should consist of some members of the UGC and a number of experts in the field coopted for the purpose.

13.73. It is sometimes stated that the UGC has so far not carried out any formal inspection of a department of any university under section 13(1) of the UGC Act, nor has it exercised the power under section 14 for withholding the grants. We do not think this to be entirely a fair criticism. The UGC arranges a visitation of the universities every five years through visiting committees and grants-in-aid are sanctioned on the basis of their recommendations. We fully support this procedure and recommend that it may even be desirable to arrange these visitations more frequently, say, every three years. Moreover, these should be done in greater detail and depth than is generally the case at present. The visiting committees should meet, not only the officers of the universities concerned and heads of departments, but also the other members of staff and the students. It would also be a good thing if written memoranda are invited from persons concerned at the time of each visitation. Similarly, we do not think that the vigilance of the UGC in financial matters is to be judged by the extent to which it has withheld grants —this is an extreme power which is not to be lightly exercised and the effects of which are likely to be adverse to the larger interests of education. In our opinion, a better basis for judgment is provided by the projects for which grants-in-aid have been sanctioned and which have been implemented so far. On this ground, we have hardly heard any criticism and have had considerable evidence to the contrary.

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[1] *Report of the Committee on Higher Education, U.K.* H.M.S.O., London, 1963, paragraphs 728-729.

13.74. It has to be borne in mind that the relationship between the universities and the UGC is a very delicate one, and that the UGC can become an effective instrument for upgrading of standards only if it follows the method of persuasion rather than coercion. In a situation of this type, there will always be some people who think that the UGC is over-exercising its authority while others will be inclined to believe that it is using it inadequately. Incidentally, we may point out that similar criticism has also been levelled against the University Grants Committee in the UK and the following quotation from its Report for 1957–62 will be found interesting:

> The major question must be whether the measure of control which the State has entrusted to the Committee is exercised too heavily or too lightly. Some people, not all, in the universities—feel that the Committee's influence has been too great or is becoming too great; others—not all outside the universities—feel it is too light. This balance of opinion is perhaps a measure of their success.[1]

13.75. In view of the magnitude and importance of the problems facing the Commission, considerably larger funds will have to be made available to enable it to deal effectively with them. An appraisal of development schemes undertaken by the Commission and those suggested by us indicates that the available allocation under the fourth plan would not be commensurate with the basic developmental needs of universities and colleges. We discuss this issue more fully elsewhere.[2]

13.76. The Model Act Committee raised the question of University Grants Commissions or Committees being set up by the State Governments for universities within a State, but made no specific recommendation. The Standing Committee of the IUB was strongly against the establishment of such Committees in the State, holding that if the State Government required any advice, it should consult the UGC. We agree with this view. In giving grants to universities, the questions of finance and standards, and collaboration between universities outside a given State, are all intimately linked. It may lead to confusion if the responsibility for coordinating standards was distributed amongst a number of bodies such as the Central UGC and the State UGCs. It would also hinder the existing direct relationship between the UGC and the universities.

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[1] *University Development* (1957—62), H.M.S.O. London, p. 198.

[2] Chapter XIX.

SUPPLEMENTARY NOTE

THE INTER-UNIVERSITY BOARD ON UNIVERSITY AUTONOMY

The Inter-University Board considered the question of university autonomy and some of the recent university legislation which went contrary to it and passed the following resolution at its 41st annual meeting held at Mysore in February 1966:

The Inter-University Board notes with grave concern and anxiety some of the recent amendments to university Acts in different States and the consequent deprivation of the academic freedom and responsibility of the universities.

In particular the Board is gravely concerned over those recent amendments whereby the vice-chancellor of the university is subjected to conditions of service which the academic world regards as humiliating and the university itself is sought to be controlled by directions likely to be issued on political and academically invalid considerations. In the opinion of the Inter-university Board, this is wholly inconsistent with the spirit of the universities and is likely to lead to the universities becoming incapable of discharging their functions efficiently.

The Inter-University Board is firmly of opinion that the mere fact that certain contributions are made by a State Government or even by the Centre cannot be a justification to bring about changes which will radically alter the composition, the working and efficiency of the Universities and humiliate the universities concerned in the eyes of the academic world. The Board is of the opinion that a statutorily established university is practically in the same position as a statutorily established political government and the mere fact that the legislatures of such governments have certain powers of legislation should not be utilised to lower the reputation of Indian universities and to make their efficient working impossible.

The Board, therefore, resolves, before taking any further steps in the matter, to appoint a committee to review the provisions in the different university Acts and the innovations that have been made which are detrimental to academic efficiency and the honour and dignity of universities and to suggest ways and means by which things can be improved so as to establish cordial relations with the Government of the day consistent with the position of the universities. The Board is of opinion that unless the vice-chancellor of a university is able to command the confidence of his colleagues and the respect of the students and unless there is sympathy and good relationship with the Government, no university can function well

The members of the Committee which consisted of Dr. C. P. Ramaswami Aiyar, Dr. A. L. Mudaliar, Dr. C. D. Deshmukh, Dr. K. L. Shrimali and Dr. B. Mullick examined the whole problem and issued the following statement:

By virtue of the generally accepted view regarding their intellectual leadership of the community, the universities are the key to social and economic progress. Therefore it is important that the universities should be helped to grow and develop their personalities unhindered by extraneous pressures. The fullest possible measure of autonomy is indispensable for their proper functioning and growth in the interests of the country's advancement and it is essential to draw attention to and oppose effectively any tendencies contrary to this objective. Keeping these considerations in mind the Committee recommends as follows:

(1) The President of India, as in the case of the Rajasthan University, should be the Visitor of every university in the country.

(2) The practice of having State Governors as chancellors of universities in their States has much in its favour, but only if the Chancellors function in their individual capacity, consulting the State Government only when they consider it necessary.

(3) Legislatures may and indeed should discuss matters of educational policy, but in order not to hamper the universities in their day to day functioning, they should refrain from discussing matters which fall essentially and peculiarly within the domestic jurisdiction of the universities.

(4) No Minister should hold any office in a university *ex-officio*.

(5) Provisions in certain recent university Acts for issuing directives or giving instructions to universities are particularly obnoxious and must be deleted. Such provisions would inevitably lead to violations of the autonomy of universities. There is no reason to believe that the authority which issues instructions to universities is more competent to decide essentially academic issues than the university itself which is functionally best constituted to deal with these problems.

(6) Conditions of service for vice-chancellors should not be made humiliating or unattractive in any manner so that suitable people may not feel deterred from accepting the post of vice-chancellorship.

(7) As in various countries, notably in England, a convention should be evolved whereby the judiciary *suo moto* treats universities as a sector of public life which should be allowed to regulate its own affairs.

(8) In order to ensure autonomy for universities it is important that the Finance Commission while allocating resources to States every five years should state as precisely as possible those considerations which have led it to allocate resources in a certain manner. At present while the Finance Commission allows increased resources to States at the time of its recommendations, the amount required for universities is not always allotted to them with the result that universities, in the absence of adequate resources, do not function effectively.

(9) Over the last few years university Acts have been amended frequently and not always on the basis of academic considerations or other adequate reasons. However, some of them need to be amended now in the light of recommendations made by the Model Act Committee Report as finally approved by the Inter-University Board and the University Grants Commission.

To sum up, the Inter-University Board seeks support in two directions from everyone in a position to help:

(A) To secure deletion of some of the provisions mentioned above, which seem to them to detract from university autonomy, *e.g.*,

  (i) provision for the removal of vice-chancellor after an inquiry by an outside authority;

  (ii) the issue of directives by an outside authority to the university;

  (iii) nomination of Ministers as pro-chancellors—*ex-officio;*

  (iv) appointment of pro-vice-chancellors without consulting the vice-chancellor.

(B) To have the existing university Acts amended in terms of the recommendations made by the Model Act Committee as finally approved by the Inter-University Board and the University Grants Commission.

CHAPTER XIV

EDUCATION FOR AGRICULTURE

I. *The Tasks Ahead.* (1-6)

II. *Agricultural Universities.* (7) Main features; (10) Scope; (11) Functions; (12) Postgraduate education and research; (22) Extension; (23) Under graduate teaching; (28) Teachers; (30) Students; (31) Farm; (32) Internship; (33) Number, size and organization.

III. *Agricultural Higher Education outside the Agricultural Universities.* (35) Contribution of universities to education for agriculture; (36) Agricultural colleges.

IV. *Agricultural Polytechnics.* (38-43)

V. *Agricultural Education in Schools* (*Classes I-X*). (45) Present position; (46-49) Recommendations.

VI. *Agricultural Education as part of General Education.* (50-51)

VII. *Extension Programmes.* (52) The problem; (54) Upgrading skills of extension workers; (57) Separation of supply services from extension work; (58) Establishment of primary extension centres; (65) Liaison with successful farmers.

VII. *Manpower Needs.* Proposals of the ISI/LSE Paper; (68) Recommendations. (69).

VIII. *The Role of the ICAR* (70-71).

Annexure. Courses in Agricultural Polytechnics (A): Diploma courses which may be offered at Agricultural Polytechnics (B); Different subjects which might be taught in Agricultural Polytechnics; (C) A sample of certificate courses which might be offered in Agricultural Polytechnics.

THE TASKS AHEAD

14.01. Recent events have dramatized the backward state of agricultural development in India. It is well known that food production has not kept pace with population growth, nor increased at a rate which can ensure at least a minimum balanced diet for all Indians. We are at the moment dependent on the surplus production of other countries to avoid famine. This is critical enough in itself but it is further compounded by the fact that an underdeveloped agriculture retards industrialization by its demands on foreign exchange, by its lack of surpluses for industrial exploitation and by the maintenance of a low purchasing power among the masses of the people. Difficult as this situation now is, it is likely to become even more critical in about ten years' time when the total population will exceed 600 million and when, on present world trends, it seems unlikely that surplus food will be available from other countries to offset our own shortages.

14.02. The tasks before agricultural development are, therefore, clear. We must attempt at least to double the production of food in the next fifteen years and maintain an adequate rate of growth thereafter. We must change food habits, lessen our dependency on the vagaries of the monsoon and the winter rains, diversify and improve the quality of the products of our farms, forests and fisheries and push through a rural improvement programme to transform the life in the villages from one of feudal backwardness into that of modernized communities.

14.03. These goals can only be achieved through the application of science and technology to the problems of agricultural production and rural betterment. This involves large-scale capital investment for the provision of irrigation, fertilizers, pesticides, improved seeds, credit facilities for farmers, satisfactory arrangements for storage and distribution of farm products, improved communications and transport, electrification, etc. But this is not enough. We must in addition provide for high quality education and research for agriculture. Without them, the necessary rapid increase in agricultural production will not be possible and there may even be a danger of the capital inputs being wasted. An instance is the present wasteful use of irrigation waters which, applied more intensively to the smaller areas and with greater attention to drainage, could significantly increase agricultural production. Indeed in some areas, knowledge can be partially substituted for capital investment.

14.04. This programme of education for agriculture will be based on three main elements—*research* or the development of the appropriate technology, *extension* or the communication of the technology to practising farmers, and *training* of the needed personnel.

(1) *Research.* The most significant of these is the development of a new agricultural technology based on science. During the past hundred years, agriculture in many parts of the world has been revolutionized, in part by the development of chemical engineering and mechanization, and in part by a more fundamental revolution in man's biological understanding. This new scientific understanding of the nature of living creatures, both plants and animals, has led to a spectacular improvement in agricultural technology in the advanced countries. Much of the existing technology of chemical fertilizers and of soil and water development can be directly applied to Indian conditions. But these and the new biological technology must be modified to suit the local conditions; and for this purpose, applied research is necessary in a number of fields including plants and animal nutrition, genetics, physiology, pathology, the various fields of microbiology and many others.

(2) *Extension.* The development of this new technology will, however, only be justified if the knowledge is conveyed to the farmers and they are motivated and trained to adopt it and increase their yields and family incomes. Apart from programmes of improving the educational level of the average farmer, this implies the organization of a large-scale programme of extension services.

(3) *Training of Personnel.* The development of the new technology, the organization of extension services to the farmer and the development of the large complex of agro-industries which the country needs will not be possible unless we train thousands of highly educated agricultural scientists and engineers and an even larger number of technicians and extension workers.

This organic link between the three elements of teaching, research and extension is necessary to ensure that there is a two-way flow from the farmer to the research worker and the classroom and from the research laboratories and teaching departments back to the farmer.

14.05. But if agricultural development is to receive the impetus it needs, education for agriculture must become a major concern of the entire national system of education whose responsibilities go beyond the training of specialised personnel. An orientation towards agriculture must be given in all educational institutions. Furthermore, the education system must give the training needed to those who will man the supporting services required for agricultural development. It must also develop an understanding of agricultural problems and rural life among the large group who deal indirectly with these, such as planners, administrators, lawyers, bankers, community leaders and entrepreneurs. It is on these groups that the better development of essential supporting services such as credit, crop insurance, marketing, pricing, distribution and the provision of better conditions and incentives for farmers will depend.

14.06. In order to develop programmes which meet the above needs quickly and effectively, it will be essential, among other things

- to set up a number of agricultural universities with integrated programmes of research, training and extension;
- to attract talented students, researchers and teachers to agriculture;
- to develop programmes of agricultural research, training and extension in other universities and institutions of higher education;
- to improve agricultural colleges;
- to establish agricultural polytechnics to train agricultural technicians;
- to give a certain orientation to agriculture and rural problems in the educational system as a whole;
- to develop agricultural extension programmes, and particularly to establish primary extension centres; and
- to associate successful and progressive farmers closely with the agricultural universities, colleges, polytechnics and primary extension centres and to give them adequate status and facilities.

These are the programmes which we propose to discuss in some detail in this chapter.

AGRICULTURAL UNIVERSITIES

14.07. **Main Features.** The central point in the programme we are recommending is the establishment of at least one agricultural university in each State. The programme is not new. In fact, beginning from the University Education Commission, there have been a series of recommendations pointing to the need for rural or agricultural universities which will have strong polarization around the agricultural sciences and which will combine the work of teaching, research and extension. As a result of these recommendations, a number of agricultural universities have already been set up. But their growth has not been very even; and no adequate attempt has been made to establish a liaison between them and the other universities. There has also been some misunderstanding of the objectives of these institutions. We shall therefore describe what, in our view, should be their basic characteristics and the manner in which they should function.

14.08. The training of agricultural graduates has been traditionally the responsibility of universities, while research and extension activities have been the province of Central and State departments of Agriculture and the Community Development Administration programmes. These have developed for the most part independently and with little liaison between them, in spite of the fact that some of the agricultural colleges have been under the administrative control of the State Governments. Such isolation has seriously affected the quality of training given and the research carried out, both of which have been insufficiently related to farm practice. The most distinctive features of the agricultural universities is their integrated programme of research, training and extension. It is this that will make the break-through in education for agriculture.

14.09. In addition, these universities should have the following features:

(1) Their concern with all aspects of increasing, disseminating, and applying knowledge related to agriculture, including basic and applied research;

(2) Their primary emphasis on teaching and research directly and immediately related to the solution of the social and economic problems of the countryside;

(3) Their readiness to develop and teach the wide range of applied sciences and technologies needed to build up the rural economy;

(4) Their readiness, not only to teach undergraduates, postgraduates and research students, but also to give specialized technical training to young people who are not candidates for degrees; and

(5) Their emphasis on adult and continuing education side by side with teaching regularly enrolled students.

14.10. **Scope.** Keeping in mind these characteristics, it is clear that the agricultural universities will be able to carry out their tasks only if their teaching and research range over many academic and professional fields. They should begin with and for some time concentrate on the traditional agricultural specialities such as agronomy, plant genetics, animal breeding, animal husbandry, veterinary science, plant pathology soil science, microbiology, horticulture, entomology and parasitology. But in time they should develop the full range of courses indicated below:

(1) *Engineering for Agriculture.* Irrigation engineering; ground-water hydrology; civil engineering for design, construction, operation, and maintenance of surface water supply systems; crop processing; mechanical engineering concerned with farm machinery and equipment, including well pumps, motors and strainers. One of the most striking failures of our engineering education has been the lack of appreciation by the engineers in charge of water resource development, of plant and soil requirements for irrigation, water supplies and drainage. A new kind of engineer is needed and in his training the agricultural universities, IITs and other universities all have a role to play.

(2) *Specialists in Human Nutrition and Food Technology.* Even with present inadequate food supplies, the diet of the poor could be considerably improved, if inexpensive high quality protein supplements could be prepared, distributed, and made acceptable to the people; if food wastage could be lowered by better methods of preservation, and if knowledge of nutritional needs and methods of meeting them could be widely disseminated among the rural people.

(3) *Agricultural Economics.* Market research, agricultural data collection and analysis, production economics farm management, rural credit, crop insurance, benefit cost analysis, and other techniques of project evaluation and price structures for farm products.

(4) *Public Administration.* Organization of government agricultural services, management of cooperatives, local self-government

and relations between different governmental levels.

(5) *Mass Communications.* Adult education, audio-visual teaching and preparation of instructional materials.

(6) *Sociology, Anthropology and Law.* Analysis of village traditions, social structures and values and their constructive modification; land tenure and tenancy systems; and development of principles of land-reform and consolidation.

(7) *Resources Conservation.* Soil and water conservation, erosion control, range management, reclamation, and soil classification and surveys. A significant proportion of India's 323 million acres of crop land and 177 million acres of forest land has deteriorated through misuse, and urgently needs remedial treatment. An overall land management strategy will depend on a national land survey and inventory, using criteria which can be expressed in terms of crop yield enhancement, costs and time periods.

(8) *Forestry.* Forest management and technology of forest products such as fuel, timber, paper and cellulose.

(9) *Fisheries.* Agricultural pond fisheries; river and lake fisheries; marine fisheries; design, construction, maintenance, and operation of fishing vessels and fishing equipment; fish processing and preservation; and fisheries economics.

(10) *Earth Sciences.* It is of the utmost importance for Indian agriculture to be able to forecast the time of the onset of the monsoon, its intensity and continuity, particularly in the first six weeks of the rainy season. These forecasts should not be on a day-to-day basis but should be made for periods of several weeks or preferably several months. In order to make such forecasts, both better meteorological data from the Indian Ocean and better understanding of the atmospherics that cause the monsoon are needed. The number of Indian meteorologists educated in modern meteorological theory, observational techniques, and forecasting methods is inadequate. There is an equal scarcity of oceanographers capable of making or interpreting oceanographic measurements. To remedy this situation, Departments of Earth Sciences should be built up as rapidly as possible in several agricultural universities. Besides emphasizing meteorology and oceanography, these departments should also concentrate on ground water geology (the technology of finding and appraising ground water resources) and on engineering geology (appraisal of dam sites and the location of materials for heavy construction).

(11) *Basic Sciences.* For all the applied sciences and engineering specialities listed above, the students will need a firm foundation of basic science. The agricultural universities should develop departments in statistics, applied mathematics, operational analysis, physical chemistry, biochemistry molecular biology and physiology.

(12) *Humanities.* Similarly, the students in the social sciences will need a background of Indian history and literature to gain an understanding of the traditions and values of rural society. The faculties of the agricultural universities should, therefore, contain some scholars in humanities, even though the faculty balance should remain strongly tilted towards practical and professional subjects.

14.11. **Functions.** The functions of the agricultural universities will be:

- research and teaching at postgraduate level, including research aimed at improving agricultural production, processing and marketing;
- teaching at the undergraduate level; and
- extension.

In research and extension, a clear delineation of responsibility between agricultural universities and the State Departments of Agriculture will need to be drawn. The universities should manage all State research stations and as far as possible, demonstration farms, but they should cooperate fully with the Departments in their extension work and coordinate this with the programme activities of the Departments.

14.12. **Postgraduate Education and Research.** The importance of the postgraduate work in providing the leadership needed in agriculture, and in bringing about quantitative and qualitative improvement in the teaching of agriculture is now widely recognized. Postgraduate education in agriculture and animal sciences has, however, not been developed on a scale commensurate with needs, either from the quantitative or from the qualitative points of view, and several important areas have been almost completely neglected.

14.13. Postgraduate work should become a distinctive feature of the agricultural universities. Their postgraduate departments will have to provide the agricultural sector with research workers, subject matter specialists and teachers for the secondary schools and agricultural polytechnics. Many of the administrative officers and certainly all the subject matter specialists in the extension service should hold M.Sc. or Ph.D. degrees. Likewise, senior scientists in all research institutes and teachers in agricultural universities and agricultural colleges should have postgraduate training.

14.14. Estimates of the requirements of specialist personnel at this level during the next twenty years have not been worked out with the precision that is necessary and possible. The ISI/LSE Paper which has been reproduced in a later section gives some basis for these; but these need further investigation, closer analysis and revision. Depending as they do on the progress in reorganization of research and extension services, the development of educational institutions and of agro-industries, the forecasts will not be useful unless they are continually revised. Broadly, however, we estimate that one hundred thousand people (agricultural research—10,000; education—35,000; agricultural and agro-industries development—55,000) with postgraduate training will be needed in the next two decades in addition to those already in position. This would mean adding 5,000 postgraduates per year during the next twenty years.

14.15. The present yearly intake into postgraduate courses is about 13,000 in various fields of agriculture, about 200 in animal sciences and negligible numbers in other fields like agricultural engineering, agricultural economics, animal breeding, and other specialised fields. To meet the anticipated output of 5,000 postgraduates per year, the present intake would have to be increased in proportion, a higher acceleration being desirable in the hitherto neglected areas.

14.16. Even more important, however, is the need to raise the quality of the product. Many of the existing institutions lack the physical facilities, adequately trained staff and in particular the atmosphere so essential for quality education. It is very important that a possible lowering of standards consequent on the numerical increase projected above should be scrupulously avoided by adequate advance preparation. For this purpose, urgent steps should be taken to strengthen the provision of staff and other facilities in existing institutions and to carry out the adjustments and changes that expansion necessitates. Indeed, from this point of view, it may be preferable to suffer a shortage during the immediate years than to produce poorly-trained personnel just to meet current demands on an *ad hoc* basis. We would, therefore, recommend that expansion of personnel and facilities should be undertaken only in a few selected, quality institutions and not be based on any other considerations.

14.17. How can quality training be ensured? Postgraduate education should not be looked upon as a mere extension of undergraduate education as appears to be the common situation in the country today. At the postgraduate level, there must be an effective integration of various disciplines and a symbiotic mingling of active research and teaching. We therefore recommend that no institution should be allowed to undertake postgraduate instruction unless it has a strong and broad-based programme of basic and applied research of its own and the members of the faculty are participating actively in the research programme. Such an active research programme is essential if teachers are to keep in touch with recent advances in general and in their own specialized fields in particular. It is also necessary if the students are to be given sufficient training in research methodology, which should be an integral part of all postgraduate training. Good libraries, well-equipped laboratories and adequate experimentation facilities are also of great importance, and no postgraduate institutions can function without them.

14.18. We also urge that before any institution is allowed to develop postgraduate instruction, a competent body of professional persons should examine the stature of the institution and the physical facilities available. Only such institutions as have adequate facilities for educaton and research should be authorized to go ahead with programmes of postgraduate instruction, 14.19. Some of the central research institutes, like the Indian Agricultural Research Institute (IARI), the Indian Veterinary Research Institute (IVRI), and the National Dairy Research Institute (NDRI), and the agricultural universities would constitute suitable centres for strong postgraduate schools in agriculture. The IARI has already gained a position of pre-eminence in this field and the IVRI and NDRI are also research and teaching institutions of national importance which are being developed still further. In addition, each agricultural university should develop postgraduate work, perhaps concentrating on certain specialities suited to their history, location and interests. Close cooperation and inter-dependence should be forged between the different agricultural universities themselves and also between them and the central research institutes which are seats of active postgraduate instruction. Free movement of staff and students from one institution to another would be highly desirable.

14.20. We understand that the premier body concerned with agricultural research, the ICAR, is itself being reorganized in such a way as to bring about close integration of education, research and extension. A process of rationalization of the research set-up in the country is envisaged with the strengthening of selected central and regional research stations and the abolition of many of the existing, poorly equipped and poorly-staffed small stations. All the central agricultural research institutes are being brought together under the ICAR which will coordinate and support problem-oriented and production-oriented research programmes at these institutions as well as in the country as a whole. Close cooperation between such central research organizations and the agricultural universities would obviously be desirable. The ICAR which is to be closely connected with agricultural education, especially in the agricultural universities, can play a very important and leading role in bringing about such integration. The ICAR has in recent years developed some very worthwhile and fruitful projects of coordinated research on an all-India basis with active Centre-State cooperation which are proving to be highly effective not only in making research activity more efficient, expeditious and productive, but also in the development of valuable research potential in the country and, what is even more important, in the creation of a cadre of able research leaders. This, we feel certain, is a welcome development for both research and higher education in agriculture and one which should be encouraged on a wider scale.

14.21. There appears to be a tendency in some agricultural colleges and agricultural universitites to restrict admission to postgraduate courses in agriculture to agricultural graduates. This, in our opinion, is a very short-sighted policy. Agricultural research cannot thrive without drawing upon the best talent from basic disciplines cognate to agricultural science. Graduates in other disciplines such as chemistry, physics, statistics, botany, zoology, etc., have obviously a great and direct contribution to make to the development of agriculture. Graduates from other faculties such as economics, business administration, engineering, etc., would also be needed and would contribute to research investigations on the assessment and utilization of resources, economic development, marketing and related fields. We are, therefore, unable to support the existing restrictive practices and urge that talents from as many fields as possible should be harnessed to the betterment of agricultural research and education.

14.22. **Extension.** The agricultural universities should be entrusted with responsibility for the research facilities and programmes of agricultural departments and for extension work which provides the necessary link between new elements of technology developed through research and application to farm practice. This may be begun by entrusting responsibility for research immediately and that for extension progressively through a phased programme. These programmes can be expanded as staff and other resources permit. In their extension work the universities should cooperate fully with the supply services and other programmes and activities of agricultural departments. We shall return to this subject a little later.

14.23. **Undergraduate Teaching.** For the next few years, the principal task of the agricultural universities would be to provide high level undergraduate education in agriculture. We shall, therefore, say something about its organization.[1] Agriculture, like all other scientific subjects, is rapidly changing. Hence the main educational tasks of the agricultural universities will be the same as for the other institutions of higher education: to give their students a deep knowledge of fundamental principles; an ability to solve new problems as they arise; and the will and ability to continue learning without a teacher throughout their careers. In the agricultural universities, as in other universities, the students should spend a major part of their time in independent study and should be introduced to research as early as possible. The aim of formal teaching should be to give the students a knowledge of the specialized language of the subject being taught, an understanding of its basic principles, an ability to use the relevant literature, and a recognition of the frontiers of knowledge in the field.

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[1] This is also applicable, *mutatis mutandis*, to the other undergraduates teaching in all universities.

14.24. During the first years of their undergraduate courses the students should, in addition to lectures and laboratory work take part in 'tutorials' or 'preceptorials', review and explanation of lecture materials. Much of their time should be spent in independent study in the library, the laboratory and on the university farm, and in solving technical problems assigned by the instructors. During their last years, the students should spend less time in lectures, review and formal laboratory work and more time on independent studies.

14.25. The requirements for independent study cannot be fulfilled unless the university library has a large collection of modern books and periodicals, which are well arranged and easily accessible to the students. The university library will need both an adequate budget for purchasing books and periodicals, and an adequate staff to order, catalogue, sort and file acquisitions, to help students and faculty members find what they need, to maintain proper procedures for taking books on loan, and to weed out obsolescent and useless books.

14.26. The teaching at all stages should de-emphasize cramming and memorization and should be designed to stimulate curiosity, to develop problem-solving ability, and to foster originality. Extra-curricular activities should be stressed, including student competitions, journalism and creative writing, debates, individual and team sports and formal and informal student discussion groups. Each of these activities should have a voluntary faculty adviser who enjoys this aspect of his work.

14.27. In keeping with the findings of other committees, we recommend that the duration of the first degree course should require five years' study after ten years' schooling. It is impossible to be rigid in this prescription because the duration of the course will depend, not so much on years of schooling, as on the attainments of the average student at the time of his entry into a degree course.

14.28. **Teachers.** The agricultural university must be a community of scientists and scholars in which the faculty members have collective responsibility and authority for academic affairs. In each university there should be groups of able scientists in each field who will work together in preparing curricula, taking special responsibility for the progress of the students, setting standards of student performance, testing and evaluating the students, organizing, developing and using laboratory, library, computer and field facilities, and stimulating each other in research and teaching through seminars, collaborative research and informal relationships. One of the earliest and also the most difficult—tasks in the establishment of these universities is, therefore, to get together this band of scientists and scholars. From this point of view, we make the following recommendations:

(1) The success of these universities will depend on their ability to provide life-time careers and a total environment for their staff members which will attract many able persons in competition with other professions. This will probably mean that, for many of their staff members, there should be a rotation of assignments between classroom teaching and laboratory research, experimental station research, and work in the field with rural people.

(2) The UGC scales of pay, which have now been revised and brought on par with those in IITs and CSIR, should be extended to these universities also. These should be subject to periodical revision to ensure that they do continue to attract able men.

(3) In structuring faculties, the aim should be, as soon as good men can be found, to appoint a number of professors in each field. In the long run, the number of professors, readers and lecturers should be determined by needs and quality of staff and not by a rigid heirarchy.

(4) Part of the undergraduate teaching should be done by the senior professors and part by teaching assistants drawn from the ranks of postgraduate and research students. The paths to faculty promotion should be based on outstanding accomplishment, independent of the accidents of seniority. The criteria for promotion should primarily be accomplishment in research, but first-rate teaching should also be rewarded. Faculty and research staff members should receive sabbatical leave every few years to refresh and renew their understanding of their own fields. Good faculty housing at low rentals should be available on or near the campus. Good schools for the children of the staff should be made available.

(5) The faculties should have a major voice in choosing their own members, but the selection of new faculty members should be on the basis of wide participation within the university faculties and not simply by the department concerned. Within broad limits established by his fellow faculty members, each teacher in an agricultural university should be free to teach as and what he thinks best. Such freedom in teaching will require that the teacher has major responsibility for assessing his own students. External examinations should be reduced in importance and abolished as early as possible. Staff members should devote only a part of their time to lectures, tutorials or preceptorials, seminars or laboratory teaching. The remainder of the time should be available for research, working with individual students, and working with fellow staff members to improve the quality of instruction, the library collections, the physical facilities, and other problems of common interest.

14.29. It is obvious that, to staff the network of agricultural universities, as well as the existing agricultural colleges and the proposed agricultural polytechnics, a large-scale programme of teacher training will have to be undertaken immediately. For this purpose, we recommend that five or six existing centres with high standards and facilities be chosen and scholarships offered on a national competitive basis to graduates in science and agriculture for training at these centres with the assurance of appointment to universities, colleges, polytechnics or extension work on the completion of their training. It may also be necessary, for some time, to send selected students abroad for training. In some cases, even the services of some teachers may have to be obtained from abroad.

14.30. **Students.** It is essential to attract talented students to the agricultural universities. We realize that many other factors such as salary, prestige and avenues of advancement will affect this. But we recommend the following two measures which will greatly help in improving the situation:

— Not less than 25 per cent of the students in agricultural universities should be awarded scholarships on the basis of an all-India test specially organized for the purpose.

— An upward revision should be made of the present scales of pay offered to the agricultural graduates.

14.31. **Farm.** It would be essential that the teaching given be linked to actual practices in farming conditions and in order to do this, well-managed farms, of sufficiently large size (around 1,000 acres and not less than 500 acres of cultivated area) should be attached to every agricultural university.

14.32. **Internship.** In order to provide a sound practical base to the graduates of agricultural colleges, for which there has been a persistent demand, the possibility of making suitable arrangements for a one year's internship on a well-managed State or university demonstration farm before a degree is finally awarded, should be seriously explored. Under present conditions, it is not possible to attach them to progressive farmers for practical training as is done in some countries.

14.33. **Number, Size and Organization.** As we have stated already, there should be at least one agricultural university in a State. In establishing them, the possibility of converting existing universities into an agricultural university may be explored. There has been some experimentation in the organization of the existing universities and not all of them are of the same type. While we are in favour of experimentation, it is essential that all agricultural universities —at least those to be established in future

—should conform to some important principles. The most important of these is that they should, as far as possible, be single campus universities which do not have any affiliated colleges. If for special and exceptional reasons the university should take over the responsibility for colleges not on its campus, they should be made constituent colleges of the university under a unified administration.

14.34. As stated earlier, it was not possible for us to obtain any precise estimates of manpower needs in agriculture, except those in the ISI/LSE Paper which have been reproduced in a later section. These indicate that the agricultural universities will have to train about 250,000 to 300,000 specialists at the graduate and postgraduate levels in a large number of categories some of which are listed below:

1. *Agriculture* (including animal husbandry and veterinary science):
    - University teachers and research workers
    - Polytechnic teachers
    - State and Central Government professional staff
    - District officers and advisers
    - Development Block Extension Officers
    - Development Block Frontier Workers Industry (Graduates)
2. *Engineering*
    - University and polytechnic teachers and research workers
    - Chemical engineers
    - Irrigation engineers and hydrologists
    - Mechanical engineers
3. *Nutrition and Food Technology*
    - University and government teachers and research workers
    - Industry
    - Distribution workers
4. *Agricultural Economics*
    - University and polytechnic teachers and research workers
    - Farm Credit Specialists
    - Marketing Analysts
    - Price Analysts
    - Operational Analysts
    - Crop Insurance Specialists
5. *Public Administration*
    - University teachers
    - Government officers
6. *Mass Communications*
    - University teachers
    - Government officers
7. *Sociology, Anthropology and Law*
    - University and polytechnic teachers and research workers
    - Land tenancy reform officers
    - Village sociologists and anthropologists
8. *Resource Conservation*
    - University and polytechnic teachers
    - Soil survey officers
    - Erosion control officers
    - Land and water management officers
9. *Forestry*
    - University and polytechnic teachers
    - Forest management officers
    - Forest product specialists
10. *Fisheries*
    - University and polytechnic teachers
    - Fresh water pond fisheries specialists
    - River and lake fisheries specialists
    - Marine fisheries specialists
    - Fishing boat and equipment specialists
    - Fish processing and distribution specialists
11. *Earth Science*
    - University and polytechnic teachers
    - Ground water and engineering geologists
    - Meteorologists
    - Physical Oceanographers
12. *Basic Science*
    - University and polytechnic teachers and research workers
    - Statisticians for government and industry
    - Biochemists for government industry
    - Physiologists for government and industry
    - Chemists for government and industry
13. *Humanities*
    - University teachers

AGRICULTURAL HIGHER EDUCATION OUTSIDE THE AGRICULTURAL UNIVERSITIES

14.35. **Contribution of Universities to Education for Agriculture.** Agricultural universities can and will undoubtedly play a leading role in the development of education for agriculture. But that is not enough. We would like to urge that the development of agricultural education should be a national concern and should be regarded as a responsibility of the university system as a whole. It is, therefore, necessary to encourage universities in general to develop suitable courses at the undergraduate and postgraduate levels. In this connection, we make the following recommendations:

(1) The disciplines which impinge and contribute to agricultural development are many, *i.e.*, biology, chemistry, physics, engineering, economics, administration, sociology, law, commerce, etc. Universities should be encouraged to develop courses at the graduate and postgraduate levels in these areas, with special reference to their application to agriculture.

(2) Universities should be encouraged to strengthen their faculties of agriculture. Care should be taken to see that adequate standards are maintained and that the available resources in men and meterials are not scattered thinly over a wide area. Where such facilities exist or are stated by universities, arrangements should be made available to them to work with agricultural experimental stations situated in their neighbourhood and to involve their faculty members and students in extension education and demonstration programmes.

(3) We also suggest that steps should be taken to establish a close relationship between some of the agricultural universities and the IITs. The possibility of developing a faculty of agriculture in an IIT should also be explored. There could be an organized exchange on a selective basis, of students and staff, and also some common programmes of study and research could be undertaken. There are a number of areas of research, as for example, those concerned with land reclamation, irrigation and water management, crop processing and storage, farm mechanization and tillage, and others where joint work by engineering and agricultural institutions could be of great value.

(4) The close collaboration in education for agriculture between the agricultural universities, the IITs and the other universities would be greatly facilitated if the same orgazation, namely the ICAR, is charged with the responsibility of overseeing the development of agricultural education, not only in the agricultural universities but outside them also. The financial support from the ICAR should also be available, not only to the agricultural universities but also for other universities and IITs for the development of education for agriculture. Similarly, the support of the UGC or the UGC-type of organization we have recommended for technological education should also be available for the development of faculties of natural or social sciences or engineering in the agriculture universities. We emphasize this close collaboration between the UGC and the ICAR which is of great significance for the development of agricultural education.

14.36. **Agricultural Colleges.** Some agricultural colleges, not forming part of agricultural universities, will continue to be affiliated to the other universities. The general policy in their regard should be on the following lines:

(1) New agricultural colleges should not be established and the training of undergraduates or postgraduates in agriculture should be done, as far as practicable, in the agricultural universities.

(2) Where agricultural colleges are constituent colleges of a university, the university concerned may be assisted to develop strong faculties in agriculture.

(3) Every agricultural college should have available a well-managed farm of at least 200 acres on which modern agricultural practices can be demonstrated.

14.37. Some of the affiliated colleges of agriculture are great institutions, e.g., the college at Coimbatore. But several of the affiliated agricultural colleges are weak institutions, especially in Uttar Pradesh. It is, therefore, necessary to adopt a vigorous policy of improvement in their regard. We recommend that

— the universities concerned should be zealous with regard to the maintenance of standards in these colleges.

- a system of quinquential inspection of all agricultural colleges should be instituted as a regular feature and should be done jointly by the ICAR and the UGC. The first such inspection should be undertaken immediately and completed within a year. The universities should be requested to disaffiliate colleges which do not come up to minimum requirements. We think that the reports of these periodical inspections will be very salutary.
- the possibility of converting some of the colleges into institutions offering courses at a higher technician level, instead of a degree, should be explored.

AGRICULTURAL POLYTECHNICS

14.38. As in technical education for industry, we believe that there is great scope in India for the training of skilled workers and middle level technicians in agriculture for the supporting services needed by the farmer, for assisting in extension work, for many trades and industries based on agricultural products, and in the service trades. We recommend that a vigorous effort be made to establish specialised institutions which will provide vocational education in agriculture at the post-matriculation level and attract large numbers of boys and girls. These institutions may be designated as agricultural polytechnics.

The programme should be developed on a priority basis. The work may begin by courses being added to existing polytechnics located in predominantly rural surroundings. However, for the best development of these and to make the maximum use of scarce resources, we recommend that they should be attached to agricultural universities and that the aim should be to set up some large scale institutions of this kind in the different States. These may begin modestly but should grow into institutions with enrolments around 1,000 or even more. We would like to emphasize that, in vocational education, small institutions are particularly uneconomic and tend also to be inefficient.

14.39. These institutions will be responsible for training the non-professional specialists required as farm mechanics, farm managers, laboratory assistants, craftsmen and technicians in agro-industries, assistants in agricultural credit and insurance organizations, assistants in extension services, self-employed craftsmen and technicians to work in the rural areas, and field representatives of fertiliser and pesticide manufacturers. They should also organize short intensive courses for farmers in such subjects as bee-keeping, seed production, etc.

14.40. The polytechnics should be multipurpose institutions providing a wide range of training in specialized courses related to the above range of skills as they are needed in animal husbandry, horticulture, processing, forestry, crop production, etc. The courses should be predominantly of a diploma character demanding up to three years' study, depending on the level of specialization required. Some craftsmen courses should also be organized for those who have less than matriculation qualifications and for these, certificates may be given. A list of some diploma certificate courses is annexed to this chapter. It will not of course be possible for any one polytechnic to offer all of them. The curriculum of each institution will be dictated by the conditions in the region it seeks to serve. The courses should, as recommended by us for industrial polytechnics, be directly practical in nature and require a significant period of practical experience.

Each polytechnic should have a large scale well-managed farm attached to it with facilities to demonstrate a full-range of mixed farming. It should have well-equipped laboratories for science teaching, and small processing plants for practical courses in food and other product-processing.

14.41. When well established, these polytechnics should offer short condensed courses for the young farmers. We also emphasize the need for designing courses of special interest to girls and women in rural areas. The importance of this, particularly in relation to applied nutrition in changing present dietary habits and in programmes of dairy or poultry development which are mostly managed by women in rural households should be obvious.

14.42. It will be necessary to ensure from the beginning that the highest standards possible are maintained and pursued. This will be principally the responsibility of the agricultural universities to whom these polytechnics will be attached in a broad way, and they should take immediate steps within the framework of the teacher training programmes, proposed later, for the recruitment and training of high level instructors required for manning the polytechnics. This would be facilitated if attractive scales of pay and adequate qualifications are prescribed for the staff of these institutions.

14.43. As with other types of vocational education, possibility should exist for the exceptional student, through further study, to take up courses in higher education. But again it is necessary to emphasize that the courses offered should be predominantly terminal in character leading to a specific employment. In order to make this effective, attention will have to be given to the status and scales of pay of diploma and certificate holders who graduate from these polytechnics and efforts will be needed by both private and public employers to ensure that such careers are made attractive.

AGRICULTURAL EDUCATION IN SCHOOLS (CLASSES I—X)

14.44. The agricultural polytechnics will function at the higher secondary stage. But one of the important questions raised before us was whether or not agricultural education should be develped at the higher primary or the lower secondary stage also. We have examined this problem very carefully and have come to the conclusion that attempts to train for vocational competence in farming through formal schooling in agriculture at the primary and lower secondary levels have failed and further efforts should be held in abeyance. In view, however, of the widespread belief that this should be done on a large scale, the problem needs closer examination.

14.45. **Present Position.** It may be desirable to recapitulate briefly the various kinds of institutions and types of training offered at present at this level and aimed at imparting vocational competence in farming.

(1) *Primary level.* With the development in many States of the concept of basic education with its emphasis on concurrent training in a craft, agriculture has been introduced as one of the primary crafts in junior and senior basic schools, especially those located in rural areas. In Uttar Pradesh, for example, in 52,654 junior basic schools (up to Class V) agriculture is the principal craft while at the senior basic stage (up to Class VIII) 2,538 institutions offer agriculture as a basic craft. It is to be noted, however, that at the junior basic stage no separate teacher for agriculture is provided while at the senior basic stage, one teacher (agricultural graduate) is provided. In Gujarat also, agriculture is the primary craft in basic schools located in rural areas. In Maharashtra, in spite of the efforts of the Government less than a quarter of the basic schools and less than 5 per cent of primary schools in the State offered agriculture as a craft. Agricultural education at this level seems to be less developed in other States of India.

(2) *Lower Secondary level.* At this level a variety of courses in agriculture are offered, with different objectives in view.

(a) First are the vocational schools or agricultural schools, which take pupils who have completed their primary education and give them a vocational training with the objective of preparing them as practical agriculturists. These vocational schools are modelled on the *Manjiri* type offering a two year diploma course. Maharashtra has especially gone in for this type of schools. It has one such school in each district of Western Maharashtra and more schools have been proposed in the fourth plan. These schools appear to be fairly well equipped and well staffed (with six agriculture-trained teachers) and there is a steady demand for admission in them, the stipend and prospects of ready employment in the Department being the main attractions. The stated objective of these schools—training sons of farmers who would go back to the land—however, is completely unrealised.

(b) In several high schools, courses in agriculture are offered either to fulfil the requirements of introducing a craft or as one of the subjects which can be elected to fulfil the requirements for matriculation. It has been stated that, in some areas, the choice of agriculture is an alternative to subjects like history and sanskrit and not mathematics or science. In U.P. there are 160 high schools offering agriculture as an optional subject. In Maharashtra, 88 (or about 3 per cent) high schools and in Madhya Pradesh, a number of higher secondary schools offer agriculture as a subject. In Gujarat, a few privately run post-basic schools offer courses in agriculture.

(c) Agriculture is also offered as one of the streams in multipurpose high schools. In 1960-61, there were more than 2,000 such schools though their number does not appear to have substantially increased later. The total curricular programme is based on a common core programme including a craft for all streams. The agriculture stream envisages two types of options, one (college preparatory) academic in content and requiring chemistry, biology or physics and mathematics and another (employment preparatory) vocationally biased course which calls for practical agriculture, applied mathematics and applied science. Both groups are expected to take a common basic course in agriculture composed of (i) agricultural economics and rural sociology; (ii) plant science and production; (iii) animal science and production; and (iv) agricultural engineering and technology, approximately half the total time being devoted to this common course.

14.46. **Recommendations.** None of these courses or programmes have succeeded in imparting the needed vocational competence or in training young persons who will go back to the land as practising farmers. We therefore recommend as follows:

(1) The introduction of agricultural education at the primary school level is not, in our opinion, likely by itself to achieve the objectives of inculcating a liking for agriculture as a way of life or of halting migration of rural people from the land, as is often claimed. Rural-urban migration depends on the interaction of many socio-economic factors of which education is one and probably a minor one at that. The type of education as at present given in such schools often results in meaningless drudgery and can well serve to instil a distaste for agriculture in the minds of the young students. Adapting the rural boy to his environment is, however, a different matter and, as we have recommended earlier, can be best achieved by giving an orientation towards agriculture to the whole educational system.

(2) The same broad conclusion will be valid at the lower secondary stage also. It has been the opinion of most people contacted by us that the training given in institutions of formal education does not lead to vocational competence. It appears rather unlikely that in a field like agriculture, vocational competency can be given in a period of two or three school years. Farming implies hard work and mature judgment and the age-group concerned (13+ to 16+) is neither physically nor mentally prepared for this. We also think that over-specialization at an early age is not at all desirable. Nor are we convinced that the narrowly vocational training is the best use that could be made of school time. As has been made clear at several places in the chapter, massive application of scientific knowledge and skills is basic to the modernization of our agrculture. We recommend, therefore, that the period which can be spent in school should be utilised in imparting a sound general education, with particular emphasis on mathematics and the sciences. This, we feel, would be the best preparation for coping with the rapid changes that are bound to characterize our agriculture in the future. It is because of these and other considerations that we have been unable to endorse the organization of formal courses in the schools for educating the primary producer.

14.47. It might be pertinent in this connection to refer to the interim proposal formulated by a Working Group of the Ministry of Education to set up 2,000 junior agricultural schools, with an enrolment of 400,000 students in the course of the fourth plan, at a cost of Rs. 750 million. These schools, apparently based on an analogy with the junior technical schools, aim, as their basic objective, at training a cadre of intelligent and enthusiastic farmers who can adopt improved farming practices. In fact they are expected to produce 'not wage earners but self-employed agriculturists.' We have carefully examined the proposal outlined by the Group but we do not think that the scheme can be successfully implemented or that its stated objectives will be attained. Apart from the difficulties of finding adequate and suitable land and staff, we are not convinced that the scheme as proposed will in fact, endow the trainees with vocational competence. As stated above, the age-group involved would be physically and psychologically unprepared for training in a demanding profession like farming. Furthermore, there does not appear to be any appreciable difference, except in the increase in agricultural practicals (and most of that in class IX when the students may be only 14+) from the Agricultural stream in multipurpose high schools which are justly considered to have been failures by the Working Group itself.

14.48. In our opinion, it is unrealistic to expect that persons with an education so much better than the majority will in the present socio-economic set up, remain on the land. Till the desire to remain on the land can be strengthened appreciably, through improved economic opportunities and attractive amenities, the attempts to create motivation to take to formal agricultural education by stipends, admission preference, etc., will not go far in achieving the objective of producing self-employed agriculturists. Indeed, the implementation of this costly scheme may well mean that scarce resources are spent on training those who are likely to be diverted into other avenues while those who will remain on the land would be denied such training.

14.49. We feel, therefore, that the proposal for setting up a large number of junior agricultural schools presents several difficulties and may fail to achieve its stated objectives. We recommend that it should be abandoned. There will, of course, be a pressing need to train middle level functionaries in extension, industry, etc., but these can be better produced by the agricultural polytechnics which we have recommended.

AGRICULTURAL EDUCATION AS PART OF GENERAL EDUCATION

14.50. This does not mean, however, that the school system till the end of the lower secondary stage (which is mainly one of the general education) has no contribution to make to the development of agriculture. On the contrary, we believe that some orientation to agriculture should form an integral part of all general education, not only at the school stage, but also at the university stage and in all teacher education. Given the economic importance of agriculture in our country, every citizen, irrespective of his residence, occupation or status should be made aware of the problem of agricultural and rural life and, in short, receive an agricultural orientation as part of his education. This will mean an awareness of the problems of the farmer, some appreciation of the skills needed in farming and of the new horizons and possibilities opened up by science and technology. Such general agricultural orientation should lead, not only to the awakening of interest and consequent diversion of many young people to agricultural careers, but also to better realization by future policy-makers of the importance of the well-being of the primary producer for the improvement of agriculture and the general economic betterment of the nation.

14.51. We, therefore, recommend the following:

(1) All primary schools including also those situated in urban areas should give an agricultural orientation to their programmes. We do not intend by this recommendation to add to the academic burden. Indeed, we are convinced that this does not require a special agricultural course but only orienting existing courses in general science, biology, social studies, mathematics, etc., towards the rural environment and the problems facing the Indian community.

(2) Agriculture can be made an important part of work-experience which we regard as one of the essential components of a national system of education. This can be made exciting and stimulating to the young mind and should not be meaningless drudgery in the name of agricultural training, especially in the earlier years, leading to a life-long aversion to agriculture as a way of life.

(3) A similar orientation towards agriculture should be continued in the lower and higher secondary stages and should form a part of work-experience at these levels as well. Science and social studies syllabuses should contain elements of agricultural and rural problems.

(4) Appropriate colleges and university faculties should include some staff members and research scholars who are interested in the role their speciality can play in modernizing agriculture. Undergraduate and postgraduate courses in colleges and universities should also give prominence to an orientation to rural and agricultural problems. One way to do this would be to set some papers in agricultural subjects which would be open to students to take as part of their course. The experience of the rural institutes in this field can be useful and should be fully utilized. The UGC and other university authorities should take suitable steps towards bringing about such orientation.

(5) Similar orientation to agriculture and rural problems should also be introduced in all teacher training programmes.

EXTENSION PROGRAMMES

14.52. **The Problem.** Clearly the most immediate task for agricultural education is to transmit to farmers the technical information now available which will enable them to increase their yields and their family incomes. At first sight, this task seems overwhelming. There are some 60 million farm families in India and at least 85 per cent of them are functionally illiterate. One way to make progress, therefore, is to concentrate on the forward looking and progressive farmers who probably are to be found amongst the third of the cultivators who now own more than half of the agricultural land. Given the large scale illiteracy even among this group, the work will have to be based mainly on demonstration at convenient centres. Further demonstration by the farmer himself within the village and the use of radio broadcasts, simple posters, etc., can carry the message further.

14.53. If agricultural extension is to succeed in the present conditions, three main changes are needed:

- The first is to upgrade the skills of extension workers. For this purpose, the training programmes of extension workers will have to be improved so that the new recruits to the cadre have adequate competence. In addition, re-training programmes will have to be devised for the persons who are already in service.
- The second is to separate extension work proper from the supply services of the Agricultural Departments. Experience has shown that the officers concerned have hardly any time for extension work when both these functions are combined.
- The third is that extension workers should be attached, not to offices, but to research centres or demonstration farms. This would enable them to carry on extension work by example rather than by percept and the farmer will, in his turn, feel greater confidence and trust in their competence to advise him.

14.54. **Upgrading skills of Extension Workers.** The need to upgrade the skills of extension workers is now generally recognized and the Ministry of Food and Agriculture has several plans for this purpose. The Village Level Worker (VLW) or *Gramsevak* is a very important part of the machinery of agricultural development since it is he who comes into close contact with the farmer and the effectiveness of agricultural extension work depends to a large extent on his efficiency. It is widely admitted now that the VLW has not been able to have the expected impact on agricultural production in the country. This was partly because of the tendency in earlier years to consider him a general development man and load him with all sorts of non-agricultural work. The lack of professional competence of the VLW aggravated this situation since he often preferred to devote most of his time to general development work where he felt less inadequate. The Ministry of Food and Agriculture proposes to take remedial action along two fronts—by relieving the VLW of a major part of the general development work and by improving his professional and technical competence. Various proposals are under consideration to recruit better qualified persons, even agricultural graduates, for these positions in the future, particularly for the districts selected for intensive agricultural development. It may not, however, be easy to recruit and retain the required number of well qualified people under the present pay scales and other conditions of service. The efficiency of the VLWs who are in position already will also have to be upgraded, if the large needs are to be met, especially in the short run.

14.55. The problem of improving the technical competence of the existing VLWs is a complex one partly because of the large numbers involved and partly because of the heterogeneous nature of the training they have had. In view of this, the Ministry of Food and Agriculture proposes to adopt a multi-pronged approach towards improving their professional competence.

(1) Such of the VLWs as satisfy the requirements for university entrance are to be deputed in a phased programme to prepare for the B.Sc. (Ag.) degree. It is expected that some 2,500 VLWs will be sent for B.Sc. (Agri.) courses during the fourth plan. The Ministry is conscious of the need to hold those who have been given higher training in their jobs and proposes to give such trainees a higher salary and better prospects.

(2) The Ministry also proposes to upgrade the Gramsevak Training Centres (GTC's) by endowing these with better staff, equipment and facilities so that higher training can be provided to selected gramsevaks to improve their professional competence and effectiveness. This is

to be done by providing a one-year advanced course to selected VLW's in various aspects of agriculture and animal husbandry. Twenty centres have already been upgraded and the Ministry proposes to upgrade all the 100 GTCs during the fourth plan at a cost of Rs. 55 million.

(3) The Ministry also proposes to intensify the refresher training programme of VLW's. This in-service training programme which is at present confined to 20 GTC's will be extended to all the 100 GTC's; two months refresher courses will be organized and all the 60,000 VLWs in position will receive this training at least once in the course of the fourth plan period. There are also proposals under consideration for imparting in-service training to VLWs through study tours.

(4) In order to equip selected VLWs with specialized knowledge in certain important fields, the Ministry has formulated a scheme for the organization of specialized training courses in such fields as soil conservation, agricultural implements, poultry keeping, plant protection, horticulture, etc. There will be 25 such centres giving six-week courses and it is expected that 15,000 VLWs will receive such specialized training in the course of the fourth plan.

(5) The Ministry has also plans for giving in-service refresher training to extension officers at the State, region and district levels, as also to the instructors at the GTC etc., as well as improving the professional competence of the officers working in the Departments of Agriculture and Animal Husbandry.

All the above programmes will necessarily mean drawing away people from their position in the villages. To make this possible, a training reserve of 10 per cent of the existing strength of VLWs is proposed to be created.

14.56. There can hardly be any doubt of the importance of the effort to raise the professional and technical competence of the VLWs and of the specialists who support them. We hope that the various proposals of the Ministry listed above will go a long way to meet the desired objective. The agricultural universities will obviously have to play an important role in this by making available the specialist staff needed and by structuring, if necessary, special courses which will round off the technical competence of the VLWs, taking into account the training and the experience they have already had. The agricultural polytechnics visualized by us would, when they are set up, also be able to play an important role in offering specialized training with a practical bias in suitable areas.

14.57. **Separation of Supply Services from Extension Work.** We were also given to understand that the separation of supply services from extension work proper is to be carried out. We welcome this move and recommend that as and when this separation takes place, the extension part of it should be transferred to the agricultural university. For the success of extension work, however, there should be the closest liaison between the extension work and the supply and other programme services of the Departments of Agriculture. It will serve little purpose to demonstrate the use of fertilizers, improved seeds, better irrigation, drainage, etc., if the farmer does not have ready access to the needed credit, insurance, seeds, water, fertilizers and pesticides on which such practices depend. The extension workers should not themselves be involved in this work, which will take them away from their farming demonstration and back to administrative work in an office. But they should maintain a close and constant contact with their colleagues responsible for this work.

14.58. **Establishment of Primary Extension Centres.** The most important change, however, is to locate the extension workers on farms run on modern lines. In our opinion, a good way of developing extension services in a community development block is to establish a good farm of adequate size which would adopt improved methods of agriculture and be run on a commercial basis. The very existence of such a farm within easy distance from the home of every farmer where he can see better agriculture being practised and made to pay would, in itself, be extension work of very great significance. If in addition there are persons attached to these farms who have been trained in modern methods of agriculture and the new techniques of mass communication, the value of such a farm for extension purposes would be considerably enhanced. We propose to designate this farm as a Primary Extension Centre. It may be a research station, a demonstration farm or a seed farm or may even be established for the sole purpose of extension.

14.59. We, therefore, recommend that at least one primary extension centre should be set up in every community development block for purposes of extension work. We realize that this cannot be done all at once. We, however, suggest that a beginning may be made wherever the necessary land and facilities are available. Some of the existing small research stations, demonstration or seed farms, may be utilised for this purpose; and the objective of policy should be to cover all the community development blocks, in a phased programme spread over a period of ten years. To these primary extension centres, leading and progressive farmers from each village in the block should be brought for demonstration, information and advice. These centres should be within cycling distance of the area they are serving. Farmers should be expected to attend them at convenient times and a simple mid-day meal should be offered, slightly better than at home, which itself may be used as an occasion for advice regarding nutrition and dietary changes.

14.60. These centres can also be utilised for giving part-time agricultural education to young persons who have left school and have adopted agriculture as a vocation. It will be recalled that we have emphasized this programme[1].

14.61. In most places where the primary extension centres would be located, there would be a secondary school also and at any rate, a higher primary school. It will be very desirable to associate such local schools with the primary extension centre with the object of providing guidance to the teacher and giving orientation in agriculture and work-experience to the students. Wherever possible, these high schools should be polarized round agriculture just as technical high schools (which are discussed in the next chapter) are polarized round technology.

14.62. These centres should be manned by two or three agricultural graduates assisted by some of the diploma and certificate holders coming from the polytechnics. They should be administratively linked to the agrcultural universities and polytechnics and should be able to call on their staff and research facilities for the information and advice they give. Research workers at agricultural universities should be available to visit the farms of the participating farmers to give any specialized advice that may be required regarding the use of new crops, the control of diseases, etc.

14.63. In order to carry out this work effectively, it would be necessary for the agricultural universities to have strong extension departments. These departments should be able to call on the appropriate faculties and specialists of the entire university staff, all of whom should have some responsibility for extension work. The extension department should be skilled in translating the research results into instructional material and farming practice that can be made available to the staff of the primary extension centre for transmission to the farmers. It will be of the highest importance for the success of these centres that the staff manning them have a practical knowledge superior to the farmers they are educating and that each centre receives the strongest support and guidance from the extension service of the agricultural university.

14.64. In addition to the demonstration and teaching given within the extension centres, the staff may organize conducted demonstration tours of the work of successful farmers.

14.65. **Liaison with Successful Farmers.** The Commission recommends that a greater use be made of successful farmers in the carrying out of extension work and in education about agriculture generally. We believe that it would contribute greatly to raising the status of successful farmers if educational and extension authorities were to give recognition to their services to the country. This can be done in a variety of ways and we hope that questions regarding standards of education would be set aside and the value of the practical farmer, who may have no certificate or degree, would be recognized in imaginative ways. We suggest that the staff of the extension centres encourage successful farmers themselves to give talks and demonstrations of their methods. The agricultural universities and polytechnics might also invite these farmers to come and discuss their problems and their successes with the staff and students of these institutions. The primary extension centres may organize some simple prizes and awards for success in new farming practices, and suitable village celebration can be undertaken to promote public esteem for the good farmer.

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[1] Chapter VII.

14.66. The individual village farmers attending courses at the primary extension centres should, as proposed by the Ministry of Food and Agriculture, also be encouraged to start Farmers' Study Circles in their villages. The spread of this extension work will mainly come from the success of the individual farmer and the imitation of his methods by other farmers in the village. The farmer being educated can, however, help in this process, once interest has been aroused, by organizing groups to study the methods that he has adopted. He should be able to call on the help of the staff of the extension centre to give occasional talks to the group. He should receive support and guidance from the extension services of agricultural universities. On occasions he should also be visited by the teaching and research staff of the agricultural polytechnics and universities. As more and more farmers agree to adopt the new practices, a link with the supply and other programme services of the Agricultural Departments to these farmers should be ensured.

14.67. In addition to the above, and as we have already suggested, fullest use should be made of the possibilities of radio and films in educating farmers and rural communities as these media do not depend on literacy for their success. The extension departments of the agricultural universities and Agricultural Departments should work in harmony with the authorities of All-India Radio to ensure that radio broadcasts are closely linked with the extension work being promoted by the primary extension centres and their agencies.

MANPOWER NEEDS

14.68. **Proposals of the ISI/LSE Paper.** It has not been possible for us to form any exact estimate of the manpower needs of agricultural development. This is a neglected area which needs detailed attention. At present, the Government itself is the largest employer of trained agricultural workers; and while some estimates can be formed of the needs in this sector, it is not possible to forecast with any accuracy the needs of agro-industries proposed to be developed, nor of young persons who would take to agriculture as a vocation. The only estimate we have is that given by the ISI/LSE Paper[1] which deals with trained agricultural graduates only and does not provide estimates of diploma holders from polytechnics. We reproduce it below for ready reference:

> At present agricultural graduates are employed mainly in technical services; even here they are relatively few. In 1960-61 these were about 14,000 agricultural graduates—just over 1 per cent of the total number of graduates in the country. Their exact disposition was not known but Table 1 shows the estimated number of posts for which an agricultural degree was required.
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> The largest single number of graduates is now employed as Agricultural Extension Officers (AEOs) at the block level; and requirements at the block level and below will continue to be a major determinant of the number of graduates needed. At present there are five AEOs per block in districts participating in the Intensive Agriculture District Programme (IADP) and not more than one or two in the other districts. The 4th Plan Working Group on Agricultural Administration and Personnel and Education and Training have recommended that by 1976 there should be five agricultural graduates in every block and by 1986, ten. The proposals of the 4th Plan Working Group on Employment and Training are broadly consistent with these proposals.
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> Further ahead it is not easy to forecast the pattern of services accurately. At present there are some 50,000 Village Level Workers (VLWs) or roughly one per ten villages. These are mostly matriculates with one or two years' further training in agriculture and other subjects. The Agricultural Personnel Committee (1958) recommended one VLW per five villages only and that the VLW should be an agricultural graduate. This would require some 100,000 agricultural graduates. Various other ideas have been put forward for disseminating modern methods in the villages. It has been suggested for example that a limited number of agricultural graduates (say one per ten villages) should be set up with land on which they could demonstrate these methods, and should also be made responsible for the sales of modern inputs in their areas (perhaps receiving some bonus related to the volume of sales).
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> It is not necessary here to make any particular assumption about the pattern of services, but only about the density of agricultural graduates. We can assume that by 1986 the present 50,000 VLWs will have been upgraded in some way. Some will have obtained agricultural degree. Others will have taken a variety of courses. We shall not include these people (however upgraded) in the figures which follow. In addition, taking our cue from the Agricultural Personnel Committee, we assume there should be another 50,000 qualified workers at village level who should be agricultural graduates. There should also be another 50,000 graduates at block, dis-

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[1] See Chapter V.

ANNEXURE

COURSES IN AGRICULTURAL POLYTECHNICS

A. Diploma Courses which may be Offered at Agricultural Polytechnics. (1) Diploma in Integrated Agriculture; (2) Diploma in Farm Management; (3) Diploma in Crop Husbandry; (4) Diploma in Crop Improvement; (5) Diploma in Plant Protection; (6) Diploma in Seed Production and Processing; (7) Diploma in Soil Health and Fertility; (8) Diploma in Laboratory Techniques; (9) Diploma in Storage of Agricultural Products; (10) Diploma in Fruit Production; (11) Diploma in Vegetable Production; (12) Diploma in Gardening; (13) Diploma in Irrigation and Drainage; (14) Diploma in Agricultural Civil Engineering; (15) Diploma in Processing of Farm Products; (16) Diploma in Processing of Horticultural Products; (17) Diploma in Farm Machinery—Use and Maintenance; (18) Diploma in Poultry Husbandry; (19) Diploma in Processing of Poultry Products: (20) Diploma in Animal Husbandry; (21) Diploma in Livestock Health; (22) Diploma in Processing of Livestock Products; (23) Diploma in Dairying; (24) Diploma in Processing and Distribution of Milk and Milk Products; (25) Diploma in Refrigeration and Cold Storage; (26) Diploma in Forestation Practices; (27) Diploma in Forest Conservation; (28) Diploma in Forest Civil Engineering (29) Diploma in Wood Technology; (30) Diploma in Carpentry and Joinery; (31) Diploma in Forest Tree Improvement; (32) Diploma in Fisheries—General; (33) Diploma in Navigation; (34) Diploma in Fishing Machinery Operation and Maintenance; (35) Diploma in Processing of Fisheries Products; (36) Diploma in Meteorology; (37) Diploma in Communication; (38) Diploma in Agricultural Extension; (39) Diploma in Education; (40) Diploma in Agricultural Economics; (41) Diploma in Rural Sociology; (42) Diploma in Sericulture; (43) Diploma in Apiculture; (44) Diploma in Pig Husbandry; (45) Diploma in Sheep Husbandry; (46) Diploma in Wool Technology; (47) Diploma in Chemistry of Farm Products; (48) Diploma in Applied Microbiology; (49) Diploma in Marine Engineering; (50) Diploma in Food Technology; (51) Diploma in Food Inspection, Analysis and Hygiene; (52) Diploma in Health Visiting; (53) Diploma in Nutrition; and (54) Diploma in Home Science.

B. Different Subjects which might be Taught in Agricultural Polytechnics. Appropriate combination of these might be required to satisfy the requirements of the various courses mentioned above. (1) General Agriculture; (2) Integrated Agriculture; (3) Soil Health and Soil Fertility; (4) Production of Field Crops; (5) Seed Production and Processing; (6) Crop Improvement; (7) Farm Management; (8) Farm Business; (9) Plant Protection—diseases; (10) Plant Protection—pests; (11) Use and Properties of Fungicides; (12) Use and properties of Pesticides; (13) Agricultural Surveying and Levelling; (14) Water Use in Agriculture (15) Agriculture Construction; (16) Land Reclamation; (17) Processing of Farm Produce; (18) Livestock Health; (19) Livestock Maintenance; (20) Livestock Nutrition; (21) Livestock Breeding; (22) Poultry Maintenance; (23) Poultry Health; (24) Poultry Nutrition; (25) Poultry Improvement; (26) Pig Husbandry; (27) Processing of Livestock Products; (28) Processing of Egg and Poultry Products; (29) Processing of Milk and Milk Products; (30) Processing of Piggery Products; (31) Chemistry of Farm Produce (32) Sericulture—Silkworm Egg Production; (33) Sericulture—Mulberry Culture; (34) Sericulture—Silkworm Diseases; (35) Sericulture—Silk reeling and Weaving; (36) Mulberry—Pests and Diseases; (37) Silkworm Improvement; (39) Applied Microbiology; (40) General Horticulture; (41) Olericulture; (42) Pomology; (43) Horticulture; (44) Gardening; (45) Landscape Gardening; (46) Forestation Practices; (47) Forest Conservation; (48) Forestry Civil Engineering; (49) Forestry Economy; (50) Forest Tree Improvement; (51) General Forestry; (52) General Fisheries; (53) Marine Biology; (54) Oceanology; (55) Climatology and Meteorology; (56) Fishing Craft—Construction and Maintenance; (57) Navigation; (58) Maritime Law; (59) Fishery Practice; (60) Fishery Law; (61) Fisheries Manufacture; (62) Fisheries Microbiology; (63) Fishing Machinery; (64) Cold Storage and Refrigeration; (65) Processing of Fishery Products; (66) Wireless Communication; (67) Embarkation Practice; (68) Electric Theory; (69) Wood Technology; (70) Logging and Wood Transport; (71) Farm Machinery—Principles and Design; (72) Farm Machinery—Use and Maintenance; (73) Metallurgy; (74) Extension Education; (75) Educational Psychology; (76) Rural Organization; (77) Rural Sociology; (78) Cookery; (79) Bakery and Flour Confectionary; (80) Dietetics; (81) Home Management; (82) Millinery; (83) Needle-work and Embroidery; (84) Tailoring; (85) Upholstery; (86) Weaving; (87) Applied Biology; (88) Applied Chemistry; (89) Applied Physics; (90) Applied Mathematics; (91) Ecology; (92) Statistics; (93) Catering; (94) Human Health; (95) Geology; and (96) Soil Science.

C. A Sample of Certificate Courses which might be Offered in Agricultural Polytechnics. (1) Agricultural Kamgars of Various Types; (2) Nursery Assistants; (3) Malis; (4) Grading, Packing etc. of Farm Produce; (5) Food and Fruit Produce Processing; (6) Dairying Processing; (7) Fisheries Operatives; (7) Tractor Operatives; (9) Tubewell or other Appliance Operatives; (10) Poultry Keepers; (11) Egg Graders and Packers; (12) Egg Processing Assistants; (15) Pig Husbandry Assistants; (16) Dressers for Livestock; (17) Woolhandlers and Shearers; (18) Carcase Utilization Assistants; (19) Laboratory Attendents; (20) Storage Assistants; and (21) Forestry Assistants.

CHAPTER XV

VOCATIONAL, TECHNICAL AND ENGINEERING EDUCATION

I. *Introductory.* (3) Development in the post-independence period.

II. *Vocational and Technical Education at the School Level.* (9) Main proposals on the subject discussed earlier; (12) Training of semi-skilled and skilled workers; (19) Technicial training: (33) Other vocational education; (34) Education for self-employment and small-scale industry, (35) Part-time education.

III. *The Education of Engineers.* (37) General observations; (39) Duration; (42) Content. (49) Teachers; (53) Equipment; (56) Post-graduate courses; (58) Wastage; (59) Costs; (62) Manpower requirements and planning; (64) Admissions.

IV. *Medium of Education.* (65)

V. *Practical Training Scheme.* (66—69)

VI. *Co-operation with Industry.* (70)

VII. *Professional Associations in Engineering.* (72-73).

VIII. *Correspondence Courses.* (74-75)

IX. *Administration of Vocational, Technical and Engineering Education.* (76—88).

INTRODUCTORY

15.01. Success in industrialization depends to a large extent on an adequate supply of skilled manpower. The Government of India has already emphasized this.

> The wealth and prosperity of a nation depends on the effective utilization of its human and material resources through industrialization. The use of human material for industrialization demands its education in science and training in technical skills. Industry opens up possibilities of greater fulfilment for the individual. India's enormous resources of manpower can only become an asset in the modern world, when trained and educated.[1]

It is the task of the planner and the educator to foresee the needs of industry and to provide the appropriate training programmes on an adequate scale and at the required levels of quality.

15.02. In the course of the chapter we shall examine some important problems of education for industry, *viz.*, the educational and training facilities at the school level for the supply of skilled workers and technicians; higher education for the supply of engineers; manpower needs; medium of education; co-operation with industry; correspondence education; and the administration of technical and engineering education.

15.03. **Developments in the Post-Independence Period.** The development of technical education has been one of the major achievements of the post-independence period. The creation of the All-India Council for Technical Education in 1945 and the Report of the Scientific Manpower Committee in 1947 had a far-reaching influence on this development. A further impetus was given by the Engineering Personnel Committee (1956) and the Committee for Postgraduate Engineering Education and Research (1961). The development of technical education as it relates to industry was promoted through the Apprenticeship Act (1961), the Industrial Training Institutes (ITIs) and junior technical schools at the skilled worker level and the spread of polytechnics at the technician level. Another significant factor that helped this development was the assistance received from friendly countries and international organizations in the form of scientific and technical equipment, services of expert professors in various branches of technology and facilities given abroad for the training of teachers. The first foreign aid for this was received from UNESCO in 1951 followed by the USA, the USSR, West Germany, Colombo Plan, etc. All higher institutes of technology are receiving the benefit of such assistance. This system now provides a good basis on which to build and the tasks ahead are to determine the directions in which expansion is needed, to make full use of existing facilities, and to improve the quality of training.

15.04. Despite repeated exhortation, it is unfortunately still widely felt that vocational education at the school level is an inferior form of education, fit only for those who fail in general education and the last choice of parents and students. A concerted effort is needed by both Government and industry, through enlightened wage policies, vocational guidance and the education of public opinion, to promote the status and value of the skilled craftsman and technician.

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[1] *Science Policy Resolution*, Government of India, 4th March, 1958.

15.05. Too sharp a distinction, however, must not be drawn between general and technical education. General school education should introduce children to the world of work and to an understanding of science and technology. Technology itself is evolving so rapidly that a student who receives only a narrow and specialized training, to the exclusion of general education in the sciences and humanities, will quickly find his skills obsolescent and lacking an adequate base for rapid re-training and ill-fitted for the complexity of the demands of the modern world. Therefore, while all general education should contain some technical education of a pre-vocational nature, all technical education should also contain an appropriate element of general education.

15.06. In our view, the education system is not organized to provide to industry a product immediately ready to assume full occupational responsibility. Formal training, even at the highest level, must always be completed by a period of practical training and internship within industry itself. A sound system of technical education results from a partnership between industry and the educational authorities. The training given within educational institutions must be linked directly with production, should be oriented to problem solving and directed towards constantly improving instructional methods through professional contacts. Industry must accept to play its full share in the preparation of those who will later man its services by providing courses, cooperating in sandwich training schemes, making available facilities and staff for part-time teaching, assisting in the drawing up of courses of study, and making technical careers attractive. Technical education can be either institution-based with training completed within industry, or industry-based with part-time education or re-training being provided by institutions.

15.07. One further preliminary remark needs to be made. Education and training for an industrial career does not terminate with the attainment of a certificate, diploma or degree but extends throughout that career. Periodic re-education and re-training to meet an ever-changing technology are becoming increasingly important.

Vocational and Technical Education at the School Level

15.08. It is generally agreed that technical training for industry is concerned with the following levels of skills:

- —semi-skilled and skilled workers (including first-line supervisors);
- —technicians (diploma holders)—both supervisory and higher-technician or technologist;
- —engineers (graduates);
- —research and design engineers (postgraduates).

Facilities at the lower secondary and higher secondary levels are concerned with the education and training of the first two groups. We shall discuss these in some detail in this section before passing on to the discussion of the education of engineers at the undergraduate and postgraduate levels.

15.09. **Main Proposals on the Subject Discussed Earlier.** To begin with, we may briefly recall our broad proposals on this subject which have been discussed in the earlier chapters. Our main recommendation is that, by 1986, some 20 per cent of all enrolments at the lower secondary level and some 50 per cent beyond Class X should be in part-time or full-time vocational and professional courses[1]. A strong effort, primarily by the Central Government is needed to encourage boys and girls particularly in the age-group 14—18 to follow vocational and technical courses. A concerted and sustained programme by all Ministries and Departments is needed to interest parents and children in technical work, in vocational courses, in making technical careers attractive and in informing public opinion of needs and possibilities. A Centrally-sponsored scheme of assistance to vocational courses, along the lines of the Smith-Hughes Act of the USA, under which direct subsidies are made from federal funds, could give an effective impetus to this programme. Schools themselves should be outward-looking to the world of work and organize effective guidance programmes[2] which can be assisted by vocational guidance committees at the district and State levels.

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[1] See also Chapter VII.

[2] See Chapter IX.

These should be made up of representatives of interested Departments, employers—particularly industry—and teachers. They should develop guidance and career information material for headmasters, teachers and parents, organize courses on vocational guidance and provide career counsellors to act as a link between the schools and employers.

15.10. At this point we would like to make clear what we intend by diversion into vocational education at the school stage. It is fundamental, in our view, that such courses at this stage be predominantly terminal in character. There should always be opportunities for the exceptionally gifted child, through further study, to rejoin the main stream and move higher. But vocational courses should not be designed with the exceptional child in mind. Bridges can be built for him, but for the great majority these courses should be terminal, qualifying for direct entry into employment, and it should be clear to the parent, child, educator and employer what type of employment the trainee will qualify for. We believe that failure to observe this principle has, in some instances, led to a confused situation in training facilities offered at this stage.

15.11. Children following the stream of general education will increasingly be introduced to the world of work through the proposed programme of work-experience and applied science given in Chapter VIII. Technical education proper can contribute to the success of this by training the instructors needed and by manufacturing in its workshops some of the tools and equipment required.

15.12. **Training of Semi-skilled and Skilled Workers.** Semi-skilled and skilled workers are now trained principally in the ITI's of which some 356 exist with a total capacity of 1,13,000. In addition, facilities exist in technical high schools principally in the area of the old Bombay State, in junior technical schools (there are 103 junior technical schools with a total potential capacity of 18,000), in artisan training centres (under the Ministry of Community Development), in the programmes of the Khadi and Village Industries Commission, in a number of private and government trade schools, and in the technical, commercial and agricultural streams of the multipurpose schools designed to give a vocational bias to the students in preparation for their training as skilled workers. Outside this institutionalized training, a proportion of the present labour force is also trained either on-the-job or through the traditional type of father-to-son training. This, in its organized form, is controlled under the Apprenticeship Act in some 1,834 establishments with more than 22,000 places.

15.13. The fourth plan proposals include a programme for the doubling of the annual output capacity of the ITI's. The Ministry of Labour and Employment, through its various committees, has recently revised the syllabuses of the different courses of the ITI's and the nature of the training to be offered. This has been done to meet, among other things, criticisms that there was overproduction of trainees in certain skills; that the type of training offered was not sufficiently practical in character and a closer cooperation between training programmes and industry was needed. It has, in addition, been suggested that the courses of study should be re-designed not only in the light of more detailed job specifications but also to include a greater amount of general education and to give the trainees a broader base of skills. Matriculation is a prerequisite for training in twelve of the trades offered and middle-school pass for the remaining thirtynine[1]. The minimum age of entry has been lowered to 15 with effect from 1966.

15.14. It is worth noting that even for courses where only a middle-pass is required, a large percentage of applicants are in fact matriculates and, in the competition for places, naturally stand a better chance. This militates against a larger diversion of pupils into vocational education after full primary education. We recommend that the possibility of a still further expansion of facilities in ITI's should be explored and if possible, the available places should be more than doubled in the fourth plan. Particular efforts should be made to attract boys after the primary school. In time we would hope that the minimum age of entry could be lowered to 14, with suitable adjustments in courses, so that there is not the present gap between completion of primary education and entry into ITI's.

15.15. The other main form of full-time technical education for skilled workers is the junior technical school and the longer established technical high school. Both accept children after the primary stage and normally offer a three or four-year course of training which combines general education and technical training including workshop practice. The success of these institutions has varied considerably. Technical high schools are reported to be popular in Maharashtra and Gujarat and the junior technical schools in some parts of Madhya Pradesh, Madras and West Bengal. However, a study[1] recently conducted by the Planning Commission, shows a high wastage rate in a number of junior technical schools, and the fact that a significant percentage of those passing out do not enter employment but rejoin the educational stream, either in polytechnics or PUC courses. We have ourselves observed instances of a confusion of aims in certain institutions and an attempt in some to offer a diluted form of diploma training. The trainees of these institutions are also at a disadvantage in comparison with those coming out of the ITI's since, on the ground of insufficient workshop practice, they are not given equivalent exemption for entry into further training under the Apprenticeship Act.

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[1] These totals include both engineering and non-engineering courses.

15.16. We recommend that the junior technical schools be renamed technical high schools (the word 'junior' serving no purpose) and along with the existing technical high schools be unmistakably designed as schools for the training of skilled workers and as such made attractive to students and employers and not be regarded as a poor alternative to general secondary education or as a more costly preparation for entry to polytechnics. The courses offered should be clearly terminal and adjusted through the greater use of available time to meet the requirements of the Apprenticeship Act (the regulations of which should be amended to accept those qualifying from these schools) and lead to trade certificates. The length of courses need not be a standardized three years but may vary from course to course, with a strong emphasis on experimental work and applied sciences in all these schools. A number of these institutions should be selected for development as quality institutions, within the framework of the proposals made in Chapter X[2]. Redesigned along the lines we have recommended and with a reduction in present wastage rates, technical high schools, with their greater emphasis on general education could be a valuable alternative to ITI's in preparing skilled workers, and to general secondary schools.

15.17. Both ITI's and technical high schools must offer production-oriented training and should be encouraged to accept some production work from industry and to manufacture material for use in other educational institutions. Their workshop exercises should be revised, revitalized and modernized.

15.18. In addition to these two forms of institutional training, we recommend that skilled workers' training courses, with entry requirements below Class X, be also attached to polytechnics. This would permit the use of existing facilities and staff and provide in some areas a further alternative form of training.

15.19. **Technician Training.** The second level of skills which the education system at the secondary level is called upon to provide is the middle-level supervisory and technician group. The technician or middle-level specialist is the one whose role is least understood in India and, as will be shown later, is the one whose numbers we believe should be immediately increased. We reproduce (as an example) a definition of his function by the Engineering Societies of Western Europe and the United States:

> An engineering technician is one who can apply in a responsible manner proven techniques which are commonly understood by those who are experts in a branch of engineering or those techniques specially prescribed by professional engineers.
>
> Under general professional engineering direction, or following established engineering technique, he is capable of carrying out duties which may be found among the list of examples set below.
>
> In carrying out many of his duties, competent supervision of the work of skilled craftsmen will be necessary. The techniques employed demand acquired experience and knowledge of a particular branch of engineering combined with the ability to work out the details of a task in the light of well-established practice.
>
> An engineering technician requires an education and training sufficient to enable him to understand the reasons for and purposes of the operation for which he is responsible.

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[1] See *Factual Survey of Junior Technical Schools*, Planning Commission, New Delhi, 1964.

[2] Technical high schools in Maharashtra and Gujarat may continue to experiment with a general technical course as well, as an alternative preparation for higher studies, and these experiments should be carefully evaluated in time.

The following duties are typical of those carried by engineering technicians:

> Working on design and development of engineering plant and structure; erecting, drawing; estimating; inspecting and testing engineering construction and equipment; use of surveying instruments; operating, maintaining, repairing engineering services and locating defects therein; activities connected with research development, testing of materials and components, soil engineering; servicing equipment and advising consumers.

Within this broad category, there are several levels of skills required ranging from the first-line supervisor or foreman of a group of workers, who may be promoted from among skilled workers and given training (as is done by the Directorate-General of Employment and Training) through the technician who may replace the engineer for well-proven assignment, to a higher technician, or a sort of technologist, qualified to replace the engineer for some design, inspection, testing and erection jobs. Technicians are, in the main, trained in three-year diploma courses in polytechnics, of which there are some 274 (plus 17 girls polytechnics) as against 43 in 1947.

15.20. In India, many graduate engineers are in fact doing what should be regarded as technician type work[1]. This is a wasteful use of their skills and an unnecessary charge on training costs. Highly industrialized countries are placing more and more emphasis on the training of middle-level technicians, whose role and status are, unfortunately, little appreciated in India. Evidence presented to us of overseas practices as well as the figures of educational attainment of those now in employment in India, tend to show that our pyramid of trained manpower is top heavy. While proportions vary from industry to industry, the ratio adopted in advanced industrialized countries appears to be of the order of 1:3 or 4 or even 1:5 or 6 (a ratio recommended by the 1956 UK White Paper on Technical Education). In India, the aggregate ratio is today 1 engineer to about 1.4 technicians. This ratio varies from industry to industry and includes certificate as well as diploma holders. The fourth plan proposals, as tentatively drawn up, would see an increase in this ratio to about 1:1.5. While overall ratios in this respect may be misleading in their application to each of the courses available at polytechnics, there seems to us to be a strong case for a much more rapid increase in facilities at the technician level[2]. We therefore strongly recommend that public and private industry take immediate steps to make the careers of technicians attractive in their status and salary conditions and cooperate with educational authorities in expanding and improving training facilities at this level. Our immediate goal should be to improve the overall ratio of engineers to technicians to 1:2.5 by 1975 and 1:3 or 4 by 1986.

15.21. For its part, the education system must make vigorous efforts to correct defects in the present training. Three criticisms are frequently heard from both industrialists and educators. One is that the courses offered by polytechnics tend to be diluted forms of engineering courses. A second is that the training is insufficiently practical or industry-oriented. A third criticism relates to the amount of wastage in students enrolling for courses. Various studies on this last point have, for different periods, shown overall range of wastage rates in diploma courses varying between 35.6 per cent and 50 per cent.

15.22. Immediate steps are needed to correct these weaknesses. In the first place, periodic investigations should be carried out in cooperation with industry, aimed at job analysis and specifications in terms of levels and clusters of skills and responsibilities for technicians. Courses should be revised in the light of these determinations, aiming not at producing a lower class engineer, but a technician in the terms we have defined. Since industry must be expected to complete, through experience and specialization, the training of technicians, as of other specialised workers, there is no need to design highly refined courses based on detailed job-by-job analysis. Groups of related skills only need be identified to begin with in certain areas of industry—civil, electrical, chemical, textiles, mechanical and mining.

15.23. A second immediate reform should aim at making diploma training more practical, by including industrial experience, particularly in the last year of training. Such practical experience should be of a project, problem-oriented type and will of necessity have to be within a speciality being practised by industry in the locality of the polytechnic. The aim would not be so much to turn out a diploma holder who has specialized in bridge building or road construction, for example, but to give practical experience in the application of the principles and processes studied during the course.

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[1] See, for example, the IAMR Study, *Co-ordination of Engineering Education with Employment of Engineering Manpower*.

[2] The same argument holds good for the ratios between skilled workers and technicians.

15.24. There are at least two important consequences of this. The first is that polytechnics should be located only in industrial areas, industrial estates or areas specifically designated for development as industrial locations. The location of polytechnics should not be determined on an arbitrary rule of one per district, but should be guided by the location of industries and employment potentials. A number of polytechnics are in rural areas where no industry exists for the moment or is likely to exist. In our view these polytechnics should develop courses allied to agriculture for the craftsmen and technicians needed by agro-industries and extension work[1].

15.25. The second important consequence of this recommendation is that the teachers in polytechnics should not be fresh degree holders from engineering colleges, but should combine good practical experience with academic qualifications. A greater effort should be made to recruit teachers, including diploma holders, from industry. Academic requirements should be relaxed to ensure this and salaries should not be linked to academic qualifications only. Extensive programme of summer institutes should be organized for the staff of polytechnics including those recently appointed. In addition to the training colleges for polytechnic teachers, courses for them should also be organized at the regional colleges of engineering and institutes of technology where the trainees should be given orientation in teaching practice as well as supervised production experience and courses in the basic sciences.

15.26. It goes without saying that every polytechnic should have well-equipped workshops and laboratories and use them fully. But to give training in as near realistic conditions as possible, we recommend that vacations be used by students and staff to do production work on hand tools, simple machine tools, small lathes, drilling machines, etc., either for equipping secondary schools or for sale. In larger towns this production work should, as far as possible, be carried out in cooperation with industry.

15.27. Due to the present relatively poor standards in science and mathematics teaching in lower secondary schools, the teaching of these subjects in polytechnics needs to be strengthened, particularly in the first two years. The long-term solution, of course, lies in better science teaching in the schools. But until this happens the polytechnics will have to take corrective measures. Since technicians will be called upon to assume semi-managerial roles, their training should also include some introduction to industrial psychology, management, costing and estimation.

15.28. As pointed out earlier, a substantial number of technicians will continue to come up, and should be encouraged to do so, through industry. Polytechnics can assist in this by offering part-time courses, though greater success would probably follow the wider institution of sandwich type courses, designed in cooperation with industry. These could, for example, be based on six months in the institution and six months industrial training. These would provide a good balance of theory and practice, permit the training of two batches per year, the uninterrupted utilization of students in industries for a significant period, and allow students, during their period in the institutions, to take full advantage of student life and college facilities. The periods within industry and in the institution could, however, vary with circumstances.

15.29. This new type of training suggested will require a much closer cooperation with industry than has been the case so far, partly in order to ensure appropriate practical experiences for students, partly to strengthen the teaching of staff within the polytechnics, and finally in order to design courses of study more closely related to industrial needs. We find that there is not a great mobility of diploma holders within India and that even when opportunities for employment are lacking on the local market, technicians are reluctant to migrate elsewhere. In our view, therefore, the courses offered in polytechnics, at least during the fourth and fifth plans, can be designed largely with local requirements in mind, though a watchful eye on total national needs should be kept. It follows from this that in designing the courses of study offered, a large degree of latitude should be allowed to the principal of each polytechnic. In arriving at decisions on this, he should look closely at local manpower needs and evolve some forecasts for his region in co-operation with industry and the State manpower officer.

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[1] See Chapter XIV.

15.30. Particular attention should be given to developing courses of special interest to girls in all polytechnics. While a majority of courses will appeal to both boys and girls, there are careers in commerce, the service trades and industry of special interest to girls. Examples are: courses in secretarial practice, pharmacy, interior decoration, electronics and radio technology, instrument technology, dress design, commercial art, medical laboratory technology, library science and architecture. Courses in these areas are already being offered in the seventeen polytechnics for girls, but all polytechnics should be assisted to offer such courses, at both the certificate and diploma levels, and to attract into them girls who have completed the lower secondary course. For some time it may also be necessary to open more polytechnics for girls in order to attract them into these courses. The principals of polytechnics should work with the guidance services and the heads of high schools in attracting girls to these careers.

15.31. In implementing the above programmes for expanded and re-oriented technician training, the greatest attention should be paid to ensuring the fullest use of facilities. Present wastage rates are around 40 per cent. Every effort must be made to reduce this to a minimum and to expand existing polytechnics to their optimum size. One of the main contributing factors to high wastage and low utilization is inadequate staffing. In 1965, about 31 per cent of sanctioned posts were 'unfilled'[1]. In addition, there is a frequent turnover of staff. Poor remuneration is most frequently quoted as the reason. This undoubtedly contributes and we recommend that immediate steps should be taken to ensure the implementation of the revised scales of pay and service conditions. This scale should overlap with that of the staff in engineering colleges but, as stated earlier, should not be tied solely to academic qualifications. This would be in keeping with our plea for enhanced status for the technician in industry and society. We believe that lack of job satisfaction also contributes to the loss of teachers and the poor response to recruitment. The production programmes for polytechnics suggested earlier, which will give the staff an opportunity to design, supervise and participate in production would, we feel, help in changing this attitude as well as in providing an additional remuneration and incentive.

15.32. As pointed out earlier, the level of responsibilities of technicians is a graded one, and at the top, in certain specific and established jobs of testing, design, installation, assistance in research and development, and supervision of manufacture, the technician may replace the engineer at a responsible level. In some countries, the category of higher technician, technician-engineer or technologist has been established to fill these roles and specific training programmes and certification provided. This is an important concept, and the numbers of these will grow in India with the further sophistication and expansion of industry. We recommend that selected polytechnics provide post-diploma courses for technicians with some years of experience in industry for the training of such higher level technicians, where the periodic surveys of job specifications recommended above, show this to be desirable, or where principals of polytechnics and industry identify the need.

15.33. **Other Vocational Education.** We have recommended a far greater diversification of courses at the higher secondary (Classes XI and XII) level. It is at this level, alongside the polytechnics, that the greatest effort can be made to vocationalize and specialize our educational system. A great range of courses in commercial, scientific and industrial trades can be offered. Terminal courses leading to certificates and diplomas in these areas, and in areas of special interest to girls such as domestic science, nutrition, nursing, social work, etc., can be of one, two, three or four years' duration and be offered in schools or special institutes (e.g., for seamen, extension workers, nurses, distributive trades, commercial art and design, etc.). Provided proper standards of curriculum, teaching staff, equipment, location and certification are maintained, the greatest latitude for local initiative and experimentation can be encouraged. Arrangements with employers for sandwich courses or for the part-time release of employees (say 2 or 3 days per week) for training purposes should be worked out and evening, correspondence and vacation courses should be offered for those who enter employment after Class VII or X[1].

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[1] For details, see Table 15.2

15.34. **Education for Self-Employment and Small Scale Industry.** The dimensions of the problems arising from the growth of the organized employment market, particularly in relation to the growth of stocks of educated people, have been discussed elsewhere[2]. We wish to stress here only one point: the responsibility of technical and vocational education for training not only those who will seek employment, but also those who will create employment. This we feel, has particular relevance at the skilled worker and technician level. With electrification, irrigation, communications and other facilities reaching villages, new opportunities for skilled craftsmen will arise, either for repair work or for small scale production. Products of technical high schools, polytechnics and the agricultural polytechnics proposed in the preceding chapter, should be encouraged to think of setting up small enterprises of their own or joining together with others in creating small-scale workshops, industries or services needed in the community, on a self-employed, co-operative or community-sponsored basis. Such enterprise is encouraged under the Small Scale Industries Scheme and educational authorities have a responsibility to interest their students in these possibilities.

15.35. **Part-time Education.** Facilities for part-time, on-the-job and vocational and technical training for those who have entered employment or are seeking employment after leaving school below Class X, need also to be greatly expanded. These may be offered on a part-time, apprenticeship, day-release, correspondence course, sandwich course, or short-intensive course basis and will vary in duration from six months to four years. The same principle should be applied with greater force at the post-Class X level. It may be pointed out that courses of this kind offered in Further Education in the UK total more than 200[3]. The numbers now enrolled in apprenticeship courses in India need also to be greatly expanded.

15.36. The agencies to be involved in the creation of such programmes would be Government (including the Armed Forces), industry, educational institutions, and professional organizations. The courses should be designed to prepare semi-skilled and skilled workers as well as supervisory personnel who are unable to join polytechnics on a full-time basis. One important consideration should be to avoid a rigidity of approach and allow local authority to design courses which, in content and duration, suit the needs of local industry and employment possibilities. Experimentation should be encouraged and the cooperation of industry will be essential. Of importance in this regard, in our view, would be the appointment of training officers in large industrial undertakings to ensure that courses of study are well designed and efficiently carried out in cooperation with educational institutions and authorities. The amount of general education to be included in these courses would vary according to the discipline and the level of educational attainment of the students enrolled.

THE EDUCATION OF ENGINEERS

15.37. **General Observations.** Though we confine our attention to the institutional preparation of future engineers, we recognize that there is a considerable number of practising engineers in India who, for many good reasons, have not taken degrees but have risen by merit and experience through industry's ranks. Many of these are holding responsible positions and discharging their duties with high competence. Since progress in industrialization will depend more and more on a deep understanding of the basic sciences, the training of engineers necessarily becomes more and more institution-based. This is as it should be. But it should also be recognized that 'practicals' have always contributed greatly to industrialization, particularly in its early stages. Since outstanding potential engineers and technicians should always have an opportunity to improve their qualifications, widespread and professionally supervised facilities for part-time, correspondence, and vacation courses should be organized for those who wish to further their training.

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[1] For suggestions on courses, see Annexure to this chapter.

[2] Chapter V.

[3] For a list of suggested courses, see Annexure to this chapter.

15.38. Institutional facilities for the education of engineers have greatly increased since 1947. As against 45 colleges in 1947, there were 133 in 1964. Expansion has created difficult problems with regard to maintenance of quality and rapid technological advances make an examination of the education of engineers more urgent each year. We shall discuss this problem under some important aspects such as the duration of courses, content, teachers, wastage, costs, equipment, postgraduate courses and manpower needs.

15.39. **Duration.** Considerable variation exists in the duration of courses and admission requirements as shown in Table 15·1.

TABLE 15·1. DURATION OF ENGINEERING COURSES FOR THE FIRST DEGREE (1965-66)

No. of institutions	Duration of courses	Minimum admission qualifications
90	5 years	Higher Secondary or equivalent)
31	4 years	I.Sc.
7	3 years	B.Sc.
4	3 years	I.Sc. [1]

[1] A few institutions in Maharashtra and Gujarat offer these courses.

15.40. We believe that ordinarily for an engineering degree a minimum of five years of engineering education after completion of the present higher secondary stage (eleven years' schooling) or its equivalent, is essential. This includes the time spent to acquire 'production experience' in industry. This may be reduced to four years after the intermediate or its equivalent. But we do not at all favour courses of three years duration after I.Sc. because it hardly seems possible, except with enormous strain on the students, to attain the required standards therein. We understand that the AICTE has proposed replacement of these by other types of courses. As a general recommendation, we urge that all institutions not conforming to the prescribed standards should be improved, or converted to institutions training technicians, or closed.

15.41. The recruitment of well-qualified B.Sc. students in engineering courses, specially in subjects such as electronics, instrumentation, should be strongly supported and encouraged, with courses suitably adjusted to make up for their inexperience in workshop practice. Such courses should be normally of three years' duration. The possibility of some of the colleges providing only post-B.Sc., engineering courses should be explored.

15.42. **Content.** There are two general observations to be made. The first is the need to strengthen the teaching of the basic sciences specially for those of our engineers who are to be concerned with research and development and participate in and even anticipate technological advances. Ways should be found for encouraging students whose gifts are for research. We find that, in many engineering institutions, science departments are treated as Cinderellas and the scales of pay of science teachers are considerably below those of their colleagues in the engineering departments. We recommend that steps be taken to remove these anomalies. The scales should be the same in science and technology faculties. Furthermore, we recommend that an appropriate number of posts (say, one-fourth or even one-third of the total strength of the department) be reserved in engineering departments, for persons with suitable qualifications in basic science subjects and an equivalent number of posts for engineers be reserved in science departments. The engineering universities should take the initiative in these matters and help should be given by the UGC. Extensive use of science (mathematics, physics, etc.) should also be made in teaching of engineering subjects. The recruitment of B.Sc. students into engineering courses at appropriate points will also help in this direction.

15.43. Here again, it is the general view—particularly of employers—that our graduates lack practical experience and knowledge of industry. The existing practice of requiring practical experience in vacation periods is open to a number of abuses. Students do not take such training seriously, are too immature in their first years to profit from it, are insufficiently supervised, and are rarely guided into a problem-solving, project-oriented way of thinking. A number of steps can be suggested to correct these defects. Practical experience for full-time students can be delayed until the third year of the course, properly prepared in cooperation with industry and properly supervised and completed before the end of the course. While we believe that a strong science base is needed by engineers, we believe, if anything, even more strongly (and this is particularly important in the context of our present needs) that production experience should be an integral part of the curriculum. We recommend the wide extension at this level, as with technicians, of sandwich type courses. A beginning in this direction should be made as early as possible, and institutions which, because of their location or other reasons, are in a favourable position to organize these courses should be given every encouragement to do so. Besides ensuring a stronger link with industry and giving a more practicable bias to training, such a practice will have other advantages. It will shorten the period before which an engineer is productive; it will permit students to earn while they learn; it will draw industry and institutions closer together; and it would permit some students in non-industrial areas to follow technical courses.

15.44. Several steps can also be taken within the institutions. Workshop practices can be made more production oriented, both in the prescribed courses and in vacation periods, with staff and students undertaking research and design of equipment needed in other educational institutions. Groups of students can be set production problems, taken from industry, as project work. Teachers and university departments should be encouraged to undertake consultancy for industry and should themselves work in industry in vacation periods. Frequent professional contacts in summer institutes between teachers and industry should be organized. Graduates should be required to have at least one year's practical experience in industry before proceeding to postgraduate work.

15.45. The requirements of industrial development in the successive five year plans make it clear that growing numbers of technical personnel will be specially required in metallurgy, chemical engineering, fuel technology, production engineering, etc., for heavy machinery manufacture, machine tools, electrical equipment, metallurgical works, fertilisers, chemical and other manufactured goods. An examination of the courses offered in the existing engineering colleges shows, however, that a majority of them provide only for the three basic fields—civil, mechanical and electrical engineering. In order to relate the courses—degree and diploma—to the varying types of engineers and technicians required by industry it is necessary to change the traditional pattern and diversify courses in the existing and new institutions to produce the needed technical personnel. The precise subject fields in which courses are to be conducted should be subject to constant review to suit the changing needs of industry for specialist technical personnel.

15.46. In addition we should like colleges and institutes of technology to become much more concerned with the future needs of industry, both in the manpower sense discussed below, and in collaborating in the form of training given. In order to make this purposeful, research design projects should be made a part of the curriculum from the third year. The aim should be to introduce students to the methodology of research. Projects could be sponsored by industry or Government and students could work in groups with assistance from postgraduate students. Public exhibitions and prizes for such research project work could be organized.

15.47. Apart from these measures to improve the present content of courses, adequate machinery for continuing revision of syllabuses is needed. General guidance can be given at the national level by expert committees drawn from industry, teachers and research workers. Rigid conformity should not be the aim of these exercises. Universities and principals of colleges should have their own machinery, in which industry and research workers collaborate, for the determination and revision of courses, with freedom for professors and departments to develop new approaches.

15.48. One of the difficulties faced in curriculum making is that we are telescoping as it were, two industrial revolutions. A large part of our industry is traditional, using processes developed many years ago. Our view is that a much more significant use could be made of technicians in this area. At the same time we are entering new fields and introducing more sophisticated processes based on newer technology and applied sciences. For these new needs—many of which must be anticipated some years in advance—courses must also be developed and manpower estimates made. Some of these fields are: (1) electronics; (2) instrument technology, including automation; (3) chemical technology; (4) in metallurgy, the processing of rare materials and special alloys; (5) aeronautics and astronautics; (6) nuclear power generation. Co-ordination at the national level is required in the location of teaching and research facilities in these new fields. Institutions should encourage the development of extra-curricular clubs and societies among students for cultivating interest in these and the traditional fields and for carrying out additional project work.

15.49. **Teachers.** In addition to the modification in curriculum and courses of study, the quality of engineering graduates can best be influenced by the quality of their teachers. We have already suggested that teachers should themselves obtain practical experience within industry through vacation work, consultancy contracts, working with industry in the development and revision of their courses of study and carrying out research for industry. In addition, widespread summer institutes for the upgrading and constant revision of the knowledge of teachers should be organized. It should also be made possible for practising engineers to take postgraduate qualifications in sessions spread over a number of years.

15.50. The key step, however, is to make the profession attractive to good engineers. This will be partly accomplished by the conditions of work and the possibilities for research, production and collaboration with industry. While it may not be possible to compete with the best that industry can offer, many high quality engineers may prefer to work in teaching and research for significant periods in their careers. To ensure this, salary scales must be adequate.

TABLE 15·2. SHORTAGE OF TEACHERS IN TECHNICAL INSTITUTIONS

Name of State	No. of Institutions	Sanctioned strength	Teachers appointed as on 31-12-63	Vacant positions as on 31-12-63	Percentage of vacant positions
Engineering Colleges					
Andhra Pradesh	8	351	266	85	24·2
Assam	2	115	54	61	53·0
Bihar	6	602	378	224	37·2
Gujarat	5	223	135	88	39·4
Kerala	6	406	249	157	38·6
Madras	9	549	382	167	30·4
Maharashtra	8	296	210	86	29·5
Madhya Pradesh	7	459	267	192	41·8
Mysore	8	516	352	164	46·6
Orissa	2	190	90	100	52·6
Punjab	5	68	68	Nil	Nil
Rajasthan	2	188	59	129	68·6
Uttar Pradesh	3	281	124	157	55·9
West Bengal	11	552	292	260	47·1
Delhi	1	12	10	2	16·7
ALL INDIA	83	4,808	2·936	1,872	38·9
Polytechnics					
Andhra Pradesh	19	570	472	98	17·2
Assam	4	110	48	62	56·3
Bihar	11	282	167	115	40·8
Gujarat	11	413	325	88	21·3
J & K	1	15	9	6	40·0
Kerala	14	428	322	106	24·7
Madhya Pradesh	13	420	231	189	45·0
Maharashtra	21	568	395	173	30·4
Madras	25	625	446	179	28·6
Mysore	25	536	428	108	20·1
Orissa	6	144	78	66	45·8
Punjab	10	155	72	83	53·5
Rajasthan	6	114	95	19	16·7
Uttar Pradesh	30	489	289	200	40·9
West Bengal	21	572	367	205	35·8
Union Territories					
Manipur	1	13	8	5	38·5
Tripura	1	20	8	12	60·0
Pondicherry	1	40	30	10	25·0
Himachal Pradesh	1	15	13	2	13·3
ALL INDIA	221	5,529	3,803	1,726	31·2

Source. Survey of technical education carried out by Ministry of Education in December 1963.

15.51. The existing shortage of teachers in engineering colleges is disturbingly large. The above survey conducted by the Ministry of Education shows an overall shortage of 28·9 per cent in engineering colleges and of 31·2 per cent in polytechnics. To help overcome the shortage of competent teachers at the college level, a technical teachers training programme has been introduced. During the training period, young graduates receive guidance from experienced teachers, get some teaching experience, and have a reasonable possibility of obtaining the Master's degree, including practical experience. So far twelve institutions have been set up under this programme. The duration of the course is three years for graduates and one year for holders of a Master's degree, including practical experience. The intake in 1965-66 was only 122—too small for our needs. It is necessary to prepare a concrete programme for improving the supply of teachers. We recommend that the institutes of technology should undertake large scale teacher training programmes for graduate and postgraduate students and that appropriate funds be made available for this. All such courses should include a study of a second modern 'world language', such as Russian or German, relevant to engineering and technology. In addition to these programmes, we recommend that the scheme for centres of advanced study be extended to cover the technological field and that centres in selected subjects be built up on an all-India basis and given the special responsibility of training teaching and research staff for engineering colleges.

15.52. All that has been said in the chapters on Higher Education on building up faculties and providing opportunities for the intellectual growth and professional development of teachers, applies with equal force here. The reputation of institutions will depend to a great extent on the quality of its departments and faculties. The present practice of frequent transfers of teachers and principals in government colleges for other than professional reasons must be stopped if the building up of faculties in them is to be effective.

15.53. **Equipment.** No effective training in basic sciences and engineering can be given without adequate laboratory and workshop facilities. Procedural delays are at the moment handicapping the development of these. Special consideration should be given to the timely release of foreign exchange and the stock-piling of essential equipment and spare parts, whether imported or indigenously manufactured. Purchasing should be coordinated through one agency. A more rational location of equipment and warehousing of parts and materials in terms of work flow, should be ensured in colleges. This study of location and work flow should form, in fact, part of the training of students.

15.54. Industry, and also defence, should be approached to loan or gift new or old equipment, or the samples of their products to institutions, both colleges and polytechnics. We add here that, in our view, polytechnics should be discouraged from acquiring sophisticated equipment which is used for only a few days in the year.

15.55. While we have heard widespread complaints at both polytechnic and college levels of lack of equipment and spare parts, we have seen little evidence of attempts to design and manufacture these locally. At various points, we have suggested that workshop practice at both levels could, at least in part, be directed towards manufacture of equipment needed by educational institutions. Specimen pieces of imported items of equipment should be dismantled and proto-type substitutes manufactured under the supervision of competent staff members. The design, working drawings and specifications may then be turned over to workshops for manufacture by staff and students as a part of practical training. Extra grants and rewards should be offered to encourage such initiative.

15.56. **Postgraduate Courses.** The growth of facilities at this level has been considerable since 1947. The total enrolment in 1965-66 was about 2,000 with facilities offered in about 41 institutions. Of these 41 centres, only 7 offer facilities for postgraduate diploma and Ph.D., with an intake capacity of 125. The total stock of postgraduate in engineering technology was estimated to be around 4,000 in 1964. The Ministry of Education has plans for expanding these centres and the IIT's for Master's Degree and postgraduate diploma courses in a wide range of subjects.

15.57. We have already recommended that admission requirements to post-graduate courses should include at least one year's experience within industry. Apart from this we do not see any necessity for uniformity in the duration of these courses which may vary between one or two years as required by the special field. Selected institutions should be encouraged to organize, in cooperation with national laboratories, research institutions and industry one or two-year postgraduate courses leading to degrees/diplomas in subjects, such as industrial engineering and management, automobile engineering, fluid motion technology, rocket technology, materials science, operational research, automation, radar engineering, welding technology, highway and traffic engineering, hydrology, marine engineering, and instrument technology. The indiscriminate proliferation of postgraduate courses should be avoided, and the location of highly specialised courses, particularly those such as aeronautics requiring expensive facilities, should be determined through consultation at the national level.

Engineering research should be directed more and more towards the problems of industry, and larger numbers of those taking postgraduate courses should be sponsored by industry, qualifying, where necessary, through sessions spread over a number of years. Apart from research, it should be permissible to obtain a doctorate degree on the basis of professional development and design work within industry. Other questions regarding research policy are discussed in Chapter XVI.

15. 58. **Wastage.** We have already referred to the alarming wastage rates within the polytechnics. The wastage rates at the degree level are equally disturbing. A number of studies have been carried out into this problem since 1959 by the Planning Commission, the Institute of Applied Manpower Research and others. The latest study shows an overall average rate of wastage at the degree level of about 20 per cent, rising in certain branches and years of study to as high as 44 per cent. The causes of this situation lie partly in financial difficulties, the absence of hostel facilities, shortage of qualified staff and their rapid turnover, lack of adequate instructional facilities and difficulties with the medium of education. We have elsewhere recommended steps which, rigorously applied, should materially assist in reducing this wastage in an area of heavy investment. Further steps can be taken through the better selection of students, arresting the present practice of relaxing minimum academic requirements for admission, and the provision of remedial courses in English for students with an inadequate command over this language.

15.59. **Costs.** There are great variations in the total cost per student at the first degree level between different types of institutions. In IITs and even in the regional engineering colleges, the cost per student is far higher than in university colleges of engineering. The present arrangements under which the university colleges receive funds (per student) which are far lower in order of magnitude than the IITs is neither justifiable nor desirable. The standard of training in the university colleges needs to be raised and this will entail a heavier cost per student. Much larger grants to university colleges are required for their improvement. The heavy investment in IITs can be best justified only by the training of quality research engineers in crucial areas urgently required for industrial development, and the training of teachers for other colleges.

15.61. We find that engineering colleges in some of the States demand a capitation fee for the award of seats and that no action has been taken to curb such practices. We strongly recommend that such requirements for admission to engineering colleges should be stopped immediately by proper regulation of admission to all such institutions.

15.62. **Manpower Requirements and Planning.** The overall considerations regarding the manpower needs within the next two decades have been discussed in Chapter VI. The Commission had before it three estimates for engineers and diploma holders. One has been produced by the Ministry of Education as the basis for calculation in relation to the fourth five year plan. A second has been developed by the Institute of Applied Manpower Research and the third by the planning unit of the Indian Statistical Institute and the Unit for Economic and Statistical Studies on Higher Education of the London School of Economics in collaboration with the Perspective Planning Division of the Planning Commission.[1] The Commission's feeling, after reviewing these studies, is that a good beginning has been made in forecasting needs in the technical field, but that, given the variations in the estimates, the range of assumptions and the inadequacy of data, there is need for rigorous and more refined studies of the educational background of the existing labour force and for more detailed studies in each branch of industry, in terms of national, regional and state needs. This general recommendation applies for the skilled worker and technician levels as for the engineering level. When these studies are made, the opening of new training facilities and admission to courses should be linked with projected manpower requirements.

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[1] See special paper on the subject for details of these as well as detailed statistics on the intake into degree institutions, specially for the years 1959-1966, Supplementary Volume I, Part I.

15.63. In the immediate future, we recommend that attention be given to the elimination of present wastage rates and to improvement in quality of the education offered through the different programmes we have suggested. These measures should be combined with the expansion of existing facilities to their optimum size and the development of part-time courses for those already in employment. All this should be done with the greatest care and with the fullest assurance that minimum standards will be maintained.

15.64. **Admissions.** A study carried out by the Education Commission into the socio-economic background of students admitted into vocational, technical and professional institutions in 1965 brought out certain differences between the possibilities open to different socio-economic groups. Full details of this study are given in a supplementary volume[1] and our recommendations on the subject are given in Chapter VI. Though in many ways remarkable progress has been made in equalizing the opportunities open to students from rural areas or of children of parents with low incomes, there are marked variations in the composition of students in the different institutions. Thus, 87.2 per cent of students in IITs are from urban areas and only 12.8 from rural areas. The position is better in the regional engineering colleges and the Government and private engineering colleges. In engineering colleges, for example, 38.7 per cent students have parents earning less than Rs. 150 per month and only 12.6 per cent with parents earning over Rs. 500 per month. What is needed, however, is an earnest effort at a greater equalization of access to professional education. In this context, we would like to emphasize, to begin with, an experimental approach. There is as yet no really sound method for identifying or selecting students for professional courses. It would, therefore, be an advantage to provide, if possible, more than one channel or procedure of selection and to compare their validity in the light of the actual performance of the selected students in the professional colleges. The possible selection channels could be the following:

(1) *Science Talent Research Project.* The students selected under this project should, if they desire, be entitled for admission to the IITs;

(2) *Special Admission Tests* such as those now held by the IITs;

(3) *Board of University Examinations.* Admitting a small percentage, say 1 per cent (or even less) to begin with, of the top students in each State on the basis of the examinations conducted by Boards of Secondary Education or universities;

(4) *School Clusters.* A decentralized process of selecting students on the basis of school clusters as described in Chapter VI.

We recommend that the Ministry of Education should set up a committee to go into this matter and devise better selection procedures to institutions of professional and vocational education.

MEDIUM OF EDUCATION

15.65. At the secondary stage and at the polytechnic stage, the regional language should be the medium of education. We agree with the decision of the All India Council for Technical Education that, for the present, English should continue to be the medium in engineering education. The switch over to Indian languages in engineering education should be linked with a similar change in science courses at the postgraduate level in the universities. English will always remain an important library language, and a good knowledge of English, as of other world languages will continue to be required of students going in for study and research in engineering. Vigorous action, however, is required for the preparation of good textbooks on technical subjects in regional languages and for the translation of foreign books and other teaching materials. This could be undertaken in part under the scheme for the re-publication of standard works on engineering which the Ministry of Education has launched in collaboration with a number of foreign countries. University teachers and industrialists should be associated with this work. This can be begun at the national level in the production of model textbooks for translation into regional languages. The central organization should work with State and regional organizations for the selection of authors, preparation of material and publication. The books may be tried experimentally in a few selected institutions before their widespread adoption. In all regional languages, care should be taken to retain a common international terminology.

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[1] See special paper on the subject in Supplementary Volume I, Part I.

PRACTICAL TRAINING SCHEME

15.66. Before 1949, very few places were available for practical training or apprenticeship to the degree and diploma holders who had not offered sandwich courses. On the recommendations of the Scientific Manpower Committee, the Central Government formulated a scheme of Practical Training Stipends in 1949 for the graduates and diploma holders. Under this scheme, practical training places are secured in industrial concerns, technical departments of the Government and other organizations where trainees can learn in practice the application of the general principles and techniques of technology in their selected fields.

15.67. During the training period a graduate is paid a stipend of Rs. 250 p.m. and a diploma holder Rs. 150 p.m. towards their expenditure on board and lodging. About 3,000 places are at present available for fresh entrants in various establishments and a large number of industrial concerns contribute towards a part of the expenditure of the trainees. We are aware of the usefulness of this scheme but we feel that some reorganization of the scheme is necessary. The Government should select only such industrial concerns or Departments where good practical experience of value to prospective employers can be acquired by the trainees. There is also need for each of such training centres to have a superintendent in charge of the training programmes. Only candidates with high academic attainments should be selected for this training. This is all the more important as many of the teaching personnel to our technical institutions come from these trainees.

15.68. We also feel that these training facilities should be available to at least 5,000 trainees every year. We are aware that even these 5,000 places may be found to be inadequate to meet the present needs as the annual output is very much larger. Many fresh graduates and diploma holders, however, are absorbed by industry immediately after passing and given on-the-job training to meet urgent needs. A number of enterprises, particularly in the public sector, have also started their own practical training programme to give training to the personnel required. Nevertheless, we feel that the Government's training scheme serves a useful purpose as it emphasizes the need to enrich technical competence by strengthening the training with organized apprenticeship.

15.69. During the course of our deliberations it has been brought to our notice that some of the public sector undertakings which have started their own apprenticeship schools are considering closing them down as they have already trained their required number of engineers and technicians. We suggest that the Central Government should take over such schools in the event of proposals to close them. These schools are often of high quality and have not only the physical plant and equipment for training purposes but have also developed a methodology of training with experienced staff. We should not lose such assets at this stage of our development.

CO-OPERATION WITH INDUSTRY

15.70. This has been a central theme of our recommendations. In some countries such as the UK, under its recent Industrial Development Act, a levy of 2½ per cent of the wage bill is imposed on industry for providing training facilities. While re-emphasizing the need for cooperation between industry and educational authorities in the development of training facilities, we feel it may not be necessary in the early stage to enact such legislation in India. In its place industry should be encouraged to start training schemes and a Central scheme of subsidy to industrial concerns providing training facilities may be usefully started. In public sector undertakings, a separate budget provision for this work could be made. Suitably qualified training officers should be posted to industry or groups of industries taking trainees. The training of these officers should be organized by the Ministry of Education. Representatives of industry and educational institutions should meet regularly to review training programmes.

PROFESSIONAL ASSOCIATIONS IN ENGINEERING

15.71. Professional societies like the Institution of Engineers, the Aeronautical Society, the Institution of Telecommunication Engineers, etc., are holding examinations to admit candidates to the fraternity of engineers. The Institution of Engineers started this activity as early as in 1928 to admit to its Associate Membership candidates who had not had the benefit of formal education and training but who were nevertheless fit to enter the profession by virtue of their experience and knowledge acquired through apprenticeship or service or in any other way. Such examinations are also recognized by the Government for purposes of employment in the relevant posts. About 1,000 candidates qualify at these examinations every year as full-fledged engineers and their numbers are growing year by year.

15.72. In our country where the system of apprenticeship or part-time training has not developed to any very significant extent (as against 100,000 students on full-time basis, there were only 1,000 for part-time courses in 1964), a heavy responsibility devolves on these societies to evaluate correctly the practical experience of a candidate, the extent of his theoretical knowledge and to decide whether he is fit or not to enter the profession as a qualified engineer. Adequate safeguards have to be made to ensure that standards are strictly maintained.

15.73. We have also recommended elsewhere the need to increase the number of special institutions organizing technical courses on a part-time basis. It would be useful if the professional societies are associated with such programmes and they give their associate membership to these part-timers also. These societies should even hold examinations jointly or recognize examinations held for them after assessing standards, etc.

CORRESPONDENCE COURSES

15.74. We have earlier laid stress on the need to develop part-time courses in all educational institutions on an evening, day-release or sandwich basis for those already in employment. In addition to these, a greater use could be made in technical education of correspondence courses for home study. It is sometimes felt that courses by correspondence are not suitable for use in technical and vocational fields requiring laboratory and workshop practice. Many countries, however, such as Australia, the United States and the USSR use correspondence study on a wide scale for vocational and technical training. It is obvious that quite a number of vocational courses, for example, book-keeping or accountancy require no practical workshop training though periods with a teacher in vacation times should be arranged even in these fields. For areas requiring workshop and laboratory training, institutions can be opened during the week-ends and the vacation periods for providing this to correspondence students.

15.75. The greatest attention should be paid to the preparation and testing of correspondence courses before their widespread use. In addition, the necessary administrative steps need to be taken to ensure that those following correspondence courses have access to a technical institution for guidance in their studies and for the practical experience required by the course. To launch such a scheme in India, it would probably be desirable to entrust the first experiments to selected quality institutions so that the many problems involved can be identified and their solutions worked out. The possibilities, however, in this type of training through correspondence are so many and the capital costs involved, if proper planning is undertaken, so small that we recommend that an immediate beginning be made to develop a wide range of vocational and technical courses through this medium.

ADMINISTRATION OF VOCATIONAL, TECHNICAL AND ENGINEERING EDUCATION

15.76. At the degree level, it has long been recognized that to ensure professional growth, it is essential that those responsible for individual institutions should have the least external control and work in an atmosphere of academic freedom. In the memorandum relative to the setting up of the regional engineering colleges, it was clearly recognized that 'the colleges shall have the maximum amount of autonomy, both financial and administrative, so that their establishment and development may proceed with speed and efficiency'. Similar autonomy for the institutes of technology was recognized in the Act of 1961. The need for such autonomy and academic freedom is re-inforced by our recommendations for the strengthening of co-operation between educational institutions and industry, for the development of new approaches in the courses offered and for the building up of high quality faculties. Heads of institutions should have adequate powers over both academic matters and the recruitment, retention and promotion of their staff. Government procedures should not be permitted to interfere with the development of academic excellence.

15.77. Below the degree level, a greater measure of freedom is also required for the principals of polytechnics in the execution of the programmes we have suggested and in the improvement of their relationships with industry and the development of suitable training facilities. At the craftsman level, a greater coordination is required between the different responsible departments, particularly at the State level.

15.78. At all levels, greater sensitivity to manpower needs and adequate planning machinery for the adjustment in time of both the strategic location of facilities and the intakes into different courses is required. This should go hand-in-hand with the programmes of vocational and educational guidance that we have suggested earlier.

15.79. In its Post-War Plan for Educational Development in India (1944), the Central Advisory Board of Education emphasized the need for planning technical education at the higher stages on an all-India basis for industrial growth and remarked that 'to stimulate, co-ordinate and control the provision of the educational facilities which such a development as well as existing industry will need, there must be an all-India body in supreme charge'. As a result, the All India Council for Technical Education or AICTE was set up in 1945 charged with surveying the needs of the country as a whole for higher technical education, and advising in what areas technical institutions should be established, for what branches of technology each should provide and up to what standards they should operate.

15.80. Over the last 20 years the Central Government has been able to play an effective role in the development of technical education. It prepares integrated plans of development of technical education in the country for the successive five year plans, establishes higher technological institutions, institutions for specialized courses and other institutions of all-India importance; aids financially and otherwise State Governments, universities and other non-government agencies in setting up technical institutions and watches progress of technical education.

15.81. The AICTE which has the Union Minister for Education as chairman and the representatives of State Governments at Ministers' level among its members, with the Technical Division of the Ministry of Education as its secretariat, constitutes at present the administrative machinery at the Centre to deal with technical education.

15.82. The AICTE discharges its functions with the help of a Coordinating Committee, four Regional Committees and eight Boards of Studies. The Coordinating Committee acts as the executive committee of the Council and coordinates the work of the Regional Committees and Boards of Studies. The functions of the Regional Committees include surveying facilities for technical education at all stages including establishment of new institutions wherever necessary, tendering advice and guidance to institutions in the region, promoting liaison between the institutions and industry and assisting the States and institutions in securing practical training facilities. The Boards of Studies advise the Council on academic aspects. They lay down minimum standards of instructional facilities necessary for conducting various courses.

15.83. The Technical Division in the Ministry of Education with regional offices at Calcutta, Bombay, Kanpur and Madras, besides acting as the secretariat of the Council, implements the Government's policies and programmes at the same time. This duality of functions by the secretariat has no doubt helped the expansion of technical education considerably and the Council has taken a leading part in increasing the output of engineers and technicians at degree and diploma levels.

15.84. While the IITs with university status, regional engineering colleges, engineering colleges, polytechnics, technical schools and other institutions have all been established, the main task to be accomplished now is the maintenance and upgrading of standards, constant efforts to design or redesign courses to suit the changing needs of industry, and relating enrolments to the manpower needs of the country.

15.85. The AICTE, which is an unwieldy body with the Union Minister as chairman, meets hardly once a year. Even its Coordinating Committee meets very infrequently and obviously the decisions thus taken tend to be more administrative than technical. The work that should normally be done by universities through their Boards of Studies is done by the Boards of Studies of the Council. While the Council performs a useful function as a high level policy formulating agency, we feel that the time has come in higher technological education to place the responsibility for stimulation and organization on the unversities and institutions themselves who should have scope for experimentation and innovation. We have therefore recommended that the responsibility for the development of technical education at the university level and maintenance of standards therein should be vested in a UGC-type body to be specially set up for engineering education. This should work in cooperation with the UGC and have some overlapping membership. Coordination would still be necessary at the Centre; and a central coordinating committee consisting mainly of professionals and industrialists from public and private sectors, could continue to operate within the Ministry of Education. But the administrative work as well as the coordination of standards at the university level could be assigned to the UGC-type body.

15.86. In order to give effect to these general principles regarding the administration of technical education, we recommend the following steps:

(1) To ensure the pursuit of the highest standards at the first degree and postgraduate levels, and to provide an adequate machinery for the national and professional concern with the future development at these levels, we have recommended in Chapter XIII the setting up of a UGC-type organization on which adequate representation should be provided for the UGC, professional organizations, industry and concerned Ministries. This body should have a full-time chairman and funds should be allotted to it on a block basis.

(2) This organization recommended above should work in the fullest collaboration with competent organizations such as the Planning Commission and the Institute of Applied Manpower Research, for the detailed elaboration and refinement of manpower projections of both a short-term and long-term nature regarding the requirements of engineers and research workers.

(3) The institutes of technology have already made a significant contribution to technical education, largely due to the academic freedom which they enjoy. To provide for their further development to their full potential, we recommend that these and comparable institutions be given full university status, while retaining their individual names and characteristics, and brought within the purview of the organization proposed above.

(4) At the State level, various departments are involved in programmes of technical training at the school, polytechnic and college levels, and practices vary from State to State. In most States, technical education has been made the responsibility of a Directorate of Technical Education; and this has given a new impetus and purpose to this work. We recommend that, in all States, Directorates of Technical Education should be set up to co-ordinate programmes and ensure continuing contact with manpower and planning mechanisms and with the district level machinery. They should be empowered to recruit staff needed for educational institutions, thus removing a number of procedural delays which now occur through the use of State Public Service Commission channels.

(5) Chairmen of Boards of Governors of regional engineering colleges, where constituted, should be drawn from a panel of distinguished educationists.

(6) The principals of colleges should have full discretion to decide matters relating to the building up of educational facilities in their institutions, within the financial ceilings and policy guide-lines laid down. The principal or his nominee should be the chairman of all subcommittees set up for the development of courses and facilities and should have full disciplinary powers vested in him in respect of the appointment of staff.

ANNEXURE

COURSES OF FURTHER EDUCATION

An Illustrative List

The need for further education for school leavers has been discussed in several chapters. We list below a few such courses which can be considered for adoption. These can be on full-time, part-time or sandwich basis, with adequate built-in flexibility regarding duration and contents to suit particular branches of study and local needs.

The list is to be taken as purely illustrative. The courses given are, to a considerable extent, drawn from the UK publication *Statistics of Education* 1963 (Part II, HMSO 1964) and adapted to Indian conditions on the basis of the publications of the Small Scale Industries and All India Khadi and Village Industries organizations. They include particular skills, groups of skills, and small scale industries.

I. **Agriculture and Allied Courses.** (1) Farm organization and management; (2) Forestry; (3) Fibre industry; (4) Gur and Khandsari industry; (5) Horticulture; (6) Poultry practice; (7) Palm gur industry; (8) Spinning and weaving; and (9) Village oil industry.

II. **Art and Design.** (1) Architecture; (2) Fashion design; (3) Furniture design; (4) Industrial design; (5) Interior decoration; (6) Landscape architecture; (7) Sculpture; and (8) Textile design.

III. **Business Administration.** (1) Accountancy; (2) Advertising; (3) Book-keeping; (4) Company and Secretarial practice; (5) Estate management; (6) Hospital administration; (7) Insurance; (8) Industrial Foremanship; (9) Librarianship; (10) Local Government and Public Administration; (11) Marketing; (12) Managerial training; (13) Office management; (14) Personnel management; (15) Salesmanship; (16) Shop assistants; (17) Windowdressing and display; and (18) Works management.

IV. **Food Trades.** (1) Bakery and confectionary; (2) Chocolate making; (3) Food inspection and analysis; (4) Food technology; (5) Milk pasteurisation, process and distribution; and (6) Warehousing.

V. **Health and Welfare**: (1) Child care; (2) Dental nurses/assistants; (3) Dispensing assistants; (4) Dispensing opticians; (5) Health visitors; (6) Midwifery; (7) Medical laboratory technicians; (8) Pharmacy; (9) Psychotherapy; (10) Public health inspection; and (11) Speech-therapy.

VI. **Home Economics.** (1) Cookery; (2) Domestic subjects; (3) Dress making; (4) Home management; (5) Millinery; (6) Needlework and embroidery; (7) Tailoring; and (8) upholstery.

VII. **Music and Drama.**

VIII. **Natural Sciences/Biological Sciences (Elementary).** (1) **Applied Biology.** (a) Bacteriology; (b) Biochemistry; (c) Botany; (d) Physiology; and (e) Zoology; (2) **Mathematics.** (a) Computing; and (b) Statistics; (3) **Applied Physics**; (4) **Other Sciences.** (a) Timber Technology; and (b) Veterinary science.

IX. **Printing and Book Production.** (1) Book production; (2) Book-binding; (3) Electro and Stereotyping; (4) Line composition; (5) Lithographic printing; (6) Monotype composition; (7) Photo engraving; (8) Photo-lithography; (9) Printing (general); and (10) Printing warehouse practical.

X. **Wholesale and Retail Trades.** (1) Flower Display; (2) Grocery; (3) Meat trade and meat distribution; (4) Other food distribution; (5) Paper Mechanidising; and (6) Retail management and storekeeping.

XI. **Leather-based Industries.** (1) Tannery; (2) Leather goods' manufacturing; (3) Footwear; (4) Leather for sports goods; and (5) Upholstery leather.

XII. **Sports Goods Industries**

XIII. **Wood-based Industries.** (1) Boat Building; (2) Carpentry; (3) Doors and windows on commercial basis; (4) Furniture; (5) Handloom and its accessories; (6) Pencil making; (7) Packing cases; (8) Photo frames; (9) Radio cabinets; and (10) Toys.

XIV **Chemical Industries.** (1) Boot polish manufacture; (2) Bakelite manufacture; (3) Carbon papers and typewriter ribbons; (4) Cattle feed; (5) Ceramics; (6) Cosmetics; (7) Cutlery; (8) Drawing and filter papers; (9) Dyeing; (10) Electroplating; (11) Fire bricks; (12) Fruit and vegetable preservation; (13) Food colours; (14) Fish curing; (15) Glass toys; (16) Hot dip galvanising; (17) Low tension porcelain insulators; (18) Matches; (19) Mirrors; (20) Metal polishing; (21) Nylon fishing nets; (22) Plastics; (23) Plaster of Paris; (24) Pigments; (25) Retreading motor tyres; (26) Rubber Canvas transmission belts; (27) Rubber toys; (28) Sealing wax; (29) Stoneware jars; (30) Slates; (31) Salt glazed sewer pipes; (32) Scientific glass apparatus; (33) Soap making; (34) Synthetic textiles; (35) Tin plating; (36) Vacuum flasks; (37) Writing inks manufacture; and (38) Water-proof packing paper.

XV. **Civil Engineering.** (1) Building; (2) Brick work; (3) Carpentry and joinery; (4) Concrete technology; (5) Costing and estimating; (6) Furnace brick work; (7) Glazing; (8) Heating and ventilating; (9) Plastering; (10) Plumbing and sanitary engineering; (11) Roof slating and tiling; (12) Structural engineering; (13) Surveying; (14) Town planning; and (15) Wall and floor tiling including mosaic work.

XVI. **Electrical Engineering.** (1) Domestic wiring; (2) Domestic electric appliances; (3) Electrical accessories; (4) Electric fans; (5) Electric horns; (6) Flourescent tubes; (7) Loud speakers; (8) Motor winding; (9) Refrigerators servicing; (10) Radio chassis; (11) Radio & television servicing; (12) Storage batteries manufacture; and (13) Small transformers.

XVII. **Engineering-General.** (1) Agricultural implements; (2) Blacksmithy: (3) Bicycle parts; Implements; (2) Blacksmithy; (3) Bicycle parts; neering; (6) Drawing boards and accessories; (7) Fittings; (8) Foundry; (9) Hand tools (10) Heat treatment; (11) Instrument engineering; (12) Metalware; (13) Motor vehicle servicing; (14) Motor vehicles painting; (15) Mechanical toys; (16) Pattern making; (17) Pumps & pipe fittings; (18) Quarrying; (19) Steel furniture; (20) Sewing machine attachments; (21) Scales manufacture; (22) Sheet metal work; (23) Water metres; and (24) Welding.

XVIII. **Miscellaneous.** (1) Bee-keeping; (2) Cinema and film studio work; (3) Ebony handicraft; (4) Gobar gas; (5) Goldsmithy and silversmithy; (6) Hair-dressing and allied services; (7) Jewellery manufacture; (8) Laundry and dry-cleaning work; (9) Lime manufacture; (10) Musical instruments; (11) Newar weaving; (12) Pottery; (13) Tobacco processing; (14) Woollen goods; (15) Other personal services; and (16) Manufacture of miscellaneous articles of daily use.

CHAPTER XVI

SCIENCE EDUCATION AND RESEARCH

I. ***Introductory.*** **(1) Significance; (2) Rapid rate of growth; (3) Quality in science education; (4)** Major steps and programmes in strengthening science **education and research; (5) Selective** approach; **(6) Some** definitions; (7) New developments.

II. *Investment in Education and Research, and National Productivity.* (10-13).

III. *Science Education.* (18) Expansion of enrolments; Supply of teachers; (24) Regional imbalances in science education; (25) Curriculum reform; (28) Workshops in science departments; (29) Practical work; (30) Inter-disciplinary studies; (32) Special courses; (34) Part-time education in science subjects; (35) A new academic degree; (37) Summer science institutes; (38) Books in science; (39) Scientific terminology.

IV. *Scientific Research.* (40) Scientific research and national prosperity; (41) Investment in research.

V. *University Research in Science.* (47) Research function of universities; (49) Academic mobility; (50) Team-work; (51) Qualifications for Ph.D. enrolments; (52) Role of mathematics; (57) Computer technology; (59) Equipment; (62) Administration of science departments; (65) Pure and applied research; (71) Expenditure on university research.

VI. *Basic Research Outside the Universities.* (75-76).

VII. *Brain Drain.* (77-82).

VIII. *Fellowships for Overseas Training.* (83).

IX. *National Science Policy.* (84-93).

X. *Science Academy.* (94-98).

XI. *Conclusion.* (99-101).

INTRODUCTORY

16.01. **Significance.** The basic approach and philosophy underlying the reconstruction of education adopted by us in this Report rests on our deep conviction that the progress, welfare and security of the nation depend critically on a rapid, planned and sustained growth in the quality and extent of education and research in science and technology. Science has radically transformed man's material environment. In the technologically advanced countries the average span of human life has increased by more than a third over the last hundred years. Science is universal and so *can* be its benefits. Its material benefits are immense and far-reaching—industrialization of agriculture and release of nuclear energy, to mention two examples—but even more profound is its contribution to culture. Science is liberating and enriching of the mind and enlarging of the human spirit. Its fundamental characteristic has turned out to be the possibility of unlimited growth. Every advance in science deepens our understanding of Nature but it also heightens the sense of ignorance. *Nature is inexhaustibly knowable.* Nothing comparable to the scientific revolution in its impact on man's development and outlook has happened since the neolithic times.

16.02. **Rapid Rate of Growth.** Science represents a cumulative and co-operative activity of mankind and its rate of growth is extremely rapid. A number of indices, such as the output of research papers or the number of scientists and engineers or the consumption of energy, indicate that the *doubling period* of science, and activities directly related to science, is some ten to fifteen years. It is not at all clear why this should be so; and why the doubling time should have nearly remained constant over the last three hundred years since the beginning of the scientific revolution in Western Europe. A doubling time of ten years means that a decade from now the volume of new knowledge gained will equal nearly that accumulated over the past several centuries. The total number of science journals was about a thousand a hundred years ago. The number now stands at a hundred thousand.[1] By the end of the present century it is expected to reach a million. The number of scientists has been doubling every ten years. Such a growth rate implies that at any given time the number of scientists alive is nearly ninety per cent of all who ever lived since the beginning of science. So rapid is the growth of science that, as some people have put it, a scientific paper is often out of date by the time it is in print; a book is out of date before a student has completed the course; a graduate is obsolescent on the day of his graduation; and a research equipment is often out of fashion by the time it is procured. Again, it is characteristic of expanding science and technology that the time gap between basic discovery and its application is continually diminishing. It was a few decades a hundred years ago, it is a few years, now. Of course, the exponential rate of growth of science cannot continue indefinitely. For example, if the present rate of increase in the number of scientists were to continue for another hundred years, the number of scientists would almost equal the total world population, an obvious impossibility. Sooner or later, therefore, the growth rate must slow down, and perhaps level off eventually with the growth rate of population. The first signs of an approach to this stage are, perhaps, becoming evident in some of the scientifically advanced countries. For instance, the growth rate of research and development expenditure which was about 15 per cent per year for more than a decade in the USA and UK is now slowing down considerably.

16.03. **Quality in Science Education.** Science has added a new dimension to education and to its role in the life of a nation, but central to all this is the quality of education. If science is poorly taught, and badly learnt, it is little more than burdening the mind with dead information, and it could degenerate even into a new superstition. What we desperately need is improvement in the standard and quality of science education at all levels in the country. Strengthening university science and research must be treated as a fundamental national goal. Strong and progressive universities constitute the foundation of all research and development effort of the nation. To achieve quality in science education and research demands serious and sustained effort, full and vigorous government and public support, a relentless pursuit of excellence, and above all it needs determination, hard work and dedication.

16.04. **Major Steps and Programmes for Strengthening Science Education and Research.** We shall describe a number of steps and action-programmes which we believe essential for strengthening of science and research. Some of these are listed below:

— recognition that teaching and research are mutually supporting activities. High quality teaching in science is possible only in a research environment—research is essential for its sustenance.

— basic research should be conducted largely within universities; and to train research workers should be their major responsibility. Laboratories for basic research, unless there be compelling reasons, should not be set up divorced from teaching.

— promotion of effective co-operation (joint research projects, training of postgraduate and research students, exchange of staff, etc.) between institutions of higher education and national laboratories and industrial and government scientific establishments/organizations;

— Centres of Advanced Study: Development of existing centres and setting up of new centres, and 'clusters of centres': the centres should serve as a major source of supply of teachers and researchers to other institutions;

— modernization of curricula; stress on experimental and field work;

— science education at all levels should be strongly reinforced through study of applications to local environment and industry;

— improvement of laboratories and libraries;

— special attention to gifted students;

— development of laboratory workshops and facilities for servicing, repair and fabrication of scientific apparatus; training of laboratory technicians;

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[1] The number of 'surviving journals' is about 35,000; and the number of journals with a run longer than about 15 years is only a few hundred.

- organization of courses in inter-disciplinary fields, and in subjects of special scientific and industrial importance;
- special attention to development of mathematical studies and research;
- production (on a national basis) of 'quality books' for undergraduate and postgraduate education;
- constitution of an effective body to advise Government on science policy, including priorities in allocation of funds for different sectors of research;
- national organization (academy) of scientists; its major role in raising quality of research and of national publications and journals in science and technology; promotion of international relations in science; and
- vigorous and continuing effort to forge strong links between science, technology and production. A high level of science education and research and a strong industrial and agricultural base go together: the three elements in the S.T.P. triad reinforce and accelerate the development of one another.

16.05. **Selective Approach.** The Report can do no more than create an awareness of the challenge we face—its urgency and magnitude—and indicate broadly the lines on which we should proceed. What is needed most to bring about a radical improvement in the present situation is a rigorously *selective approach*, a concentration of effort to build centres or peaks of excellence to serve as pace-setters and 'breeders' of more centres of excellence. It implies that the scale of support to institutions is determined on the basis of national needs and their level of performance, capabilities and potentiality for growth and development. No country, affluent or poor, can afford to squander its resources on institutions which are of indifferent quality and determined to remain stagnant. When resources are scarce and problems formidable, the principle of concentration and selectivity becomes all the more imperative. Of course, it has to be applied not mechanically but imaginatively and wisely.

16.06. **Some Definitions.** In this chapter and in the Report generally we use the terms science, and scientist, in two senses, *general* and *limited*. (The word scientist was first used in 1840 by William Whewell, Master of Trinity College, Cambridge). In its general sense 'science' covers the entire spectrum of scientific knowledge, pure and applied, extending from mathematics and basic science subjects to metallurgy, engineering and agriculture.[1] In its limited sense, science stands for pure or basic science subjects such as physics, chemistry, biology, biochemistry and geology. In the case of basic science subjects the main concern is with the discovery of fundamental laws and operations and of gaining insight into the working of nature. Applied science deals with application of basic sciences to meet man's diverse material and cultural needs, and it includes all engineering and technological subjects. The term research includes 'pure research' and 'applied research'. We use pure research and basic research as equivalent terms. Applied research does not include 'development' which is a stage linking applied research to production. We use the term *R and D* to include the whole spectrum of research and development activities, including design and testing of prototypes.[2] Development is usually the most costly activity of all.

16.07. It should be recognized that the distinction between pure science and applied science, and between basic and applied research, as also between research and development, which was well-defined a few decades ago is now getting less and less sharp. In some fields hardly any distinction can be drawn. In fact, the great strength of contemporary science lies in the close interaction and mingling of basic and applied sciences.[3]

16.08. **New Development.** It is almost certain that in the next decade or two we may see unravelling of the details of the genetic code, and with it a rapid progress in the cure of hereditary diseases and eventually a partial control of the progress of man's evolution itself. Advances in molecular neurology and understanding of the process in the brain may provide new means of influencing and modifying man's mental state. Manned flights will be achieved not only to the moon, but possibly also to other planets. The discovery, when it comes, of life (intelligent life, who knows?) outside the earth will have the most profound consequences for man's development and his future destiny. It is almost certain that within the next ten years communication satellites will be able to picture broadcasts to domestic TV-receivers anywhere in the world, thus opening up revolutionary possibilities for education. Progress in computer technology is likely to revolutionize, through cybernetics and automation, many aspects of man's life. The study of *quasers* may bring to light some entirely unsuspected process of energy generation, and provide new clues to the origin of the universe. New discoveries in high-energy physics may provide an altogether new insight into the nature of sub-atomic particles. Godel's epochal work on the axiomatic foundations of mathematics has revealed an inherent limitation' of mathematical reasoning and logic which has far-reaching philosophical implications.

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[1] In the USSR and the Continent of Europe the term *science* has a much wider connotation. It also includes economics, social sciences and allied subjects.

[2] The Report (1961) of the Committee on the *Management Control of Research and Development in the UK* (Chairman Sir Solly Zuckerman) has differentiated under the term R and D, five categories of activity. These are : pure basic research, objective basic research, applied (project) research, applied (operational) research and development.

[3] H.J. Bhabha, J.D. Cockcroft and P.A.M. Dirac, three top-ranking physicists had their first degrees in engineering.

16.09. There is no doubt that to several of these and other exciting fields India will make contributions of some significance. but it is certain that the shape, quality and volume of future science in the coming decades will be determined essentially by the work of the countries which are in the forefront of science today. This simple fact has far-reaching consequences for us. It implies that our university courses, specially at the postgraduate stage, and research activities will be largely fashioned and determined by developments which will occur outside the country. It underscores the importance in our system of education of the study of English and other world languages, and of giving a high priority to an energetic expansion on a big scale of library facilities so that we could derive full benefit from the rapidly growing world-stock of science and technology. Above all it means that no effort should be spared to identify the truly gifted individuals and to give them every possible opportunity and encouragement for the unfolding of their innate abilities and creative potential.

INVESTMENT IN EDUCATION AND RESEARCH AND NATIONAL PRODUCTIVITY

16.10 Let us for a moment compare the expenditure on higher education in India and the industrially advanced countries. It is an interesting statistical fact that the average expenditure on higher education per student per year, in almost every country is of the same order as the GNP per capita.[1] For example, the expenditure per student per year in our country is about one-thirtieth of that in the UK. The cost of scientific instruments and apparatus is about the same in the two countries. Further, India has largely to import special apparatus required for advanced study and research. This needs foreign exchange which is in very short supply. It is in a sense inevitable that the level of laboratory equipment and other basic facilities (including books and journals) available to an Indian student will be, on an average, far below that available to students in highly industrialized countries. It may also be noted that in the scientifically advanced countries the cost per student in pure science, in undergraduate and postgraduate courses, is roughly the same as that in engineering and agriculture. The expenditure per student in the universities in the UK for 1963-64 was: Art £501; Social Sciences £465; Pure Science £757; Applied Science £671; Agriculture £916 and Medicine £1.078[2]. The USA figures faculty-wise are Humanities $3.200, Education $3,300; Social Sciences $3.250: Biological Sciences $3,374; Physical Sciences and Mathematics $3,380; Engineering $4,020.[3] In India the average cost per student in pure science is much less than that for engineering. This is because our science laboratories in general are very poorly equipped and very little attention is paid to practical work and demonstration experiments.[4]

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[1] The relationship does not hold for some of the African countries which spend on higher education per student about as much as the highly industrialized countries, but their enrolments in higher education are proportionately extremely small.

[2] *Source.* Fifth Report of the Estimate Committee—*Grants to Universities and Colleges* (UK, July, 1965).

[3] The President's Science Advisory Committee Report on *Meeting Manpower Needs in Science and Technology.*

[4] It is worth recalling that according to the Report of the Indian Education Commission of 1882 the average cost per student in government colleges at that time was about Rs. 350 per year which in terms of current price-level would be roughly ten times higher than what we spend today. As against this fall in the cost per student, the enrolment in highe ducation has increased nearly a thousand-fold.

16.11. The industrialized countries have a much higher GNP per capita and thus can, and do, invest in education and research on a scale higher by orders of magnitude than the under-industrialized parts of the world.[1] A highly industrialized country needs for the bulk of its scientists and engineers a much higher level of education and training than does an under-industrialized country. At the present level of our national economy the education of a vast majority of scientists and engineers cannot be at the level reached by the highly industrialized countries. However, when it comes to postgraduate studies and research, and the training of those who will become leaders in their professions, the standard of attainment must bear international comparisons. For our best we must aim to provide the best education according to international standards. The only way this can be done is through a most careful selection of subjects for advanced study and research, selection of the most able students for such courses, and by building a small number of centres of excellence and assigning to each of these resources exceeding a certain critical size. These centres will determine the general tone of scientific work in the country and would serve as 'growing points' for excellence.

16.12. It may be of interest to pursue a little further the connection between national productivity and investment on education and research. That there is a close interconnection, a coupling, between them is apparent from a glance at Table 16.7 appearing later in the chapter. It is also vividly brought out by charts on pages 394 and 395. The relationship is essentially an expression of the fact that the modern world is science and technology based. However, it is not to be interpreted as a simple cause-and-effect relationship. A country would not automatically become prosperous by merely ploughing in more money into education and research. In fact it could also have the opposite effect. What the relationship implies is that science education and research of the right type and geared to national needs will lead to a rise in productivity. The increased productivity in its turn would provide more resources for science and research, and thus will be generated the rising (S-T-P) spiral of science, technology and productivity.

16.13. It is unfortunate that India today is almost at the bottom end of the ladder of GNP per capita, as also of the ladder of per capita expenditure on education and research. The Indian expenditure on education from primary to higher, and research and development, is about Rs. 15 per capita per year: it is about 3 per cent of the GNP. The corresponding figure for the USA is Rs. 2,000 (at 10 per cent of the GNP). By the end of the century the per capita Indian expenditure on education and research, on most optimistic projections, may go up to Rs. 200 per year (at constant prices)—this would be as high as nearly ten per cent of the per capita GNP at that time. The corresponding figure for the USA is likely to exceed Rs. 10,000 per year. The big gap of today would become far bigger in the coming decades. Even if we cannot foresee all the far-reaching consequences inherent in such a situation, the moral for us is plain. In the utilization of our scientific manpower, we must strive our utmost to achieve high efficiency—higher even than that of the industrially developed countries, if we can. As the number of competent scientists and technologists available at any time is severely limited, hard and sometimes unpleasant choices have to be made between alternative programmes and courses of action. This cannot be evaded—it is inherent in the very nature of things. There is no place for complacency, but equally none for losing heart or being swept off the feet. The one thing that is supremely necessary in an age of rapid change and radical innovation is that we determine our priorities and programmes in education and research on the basis of hard 'indigenous' thinking and needs, and not follow the fashion set by other countries whether highly 'advanced' or not so advanced. For instance, if we set as a goal to produce as many doctorates in physics as the USA is doing currently, it will be senseless not only because it is

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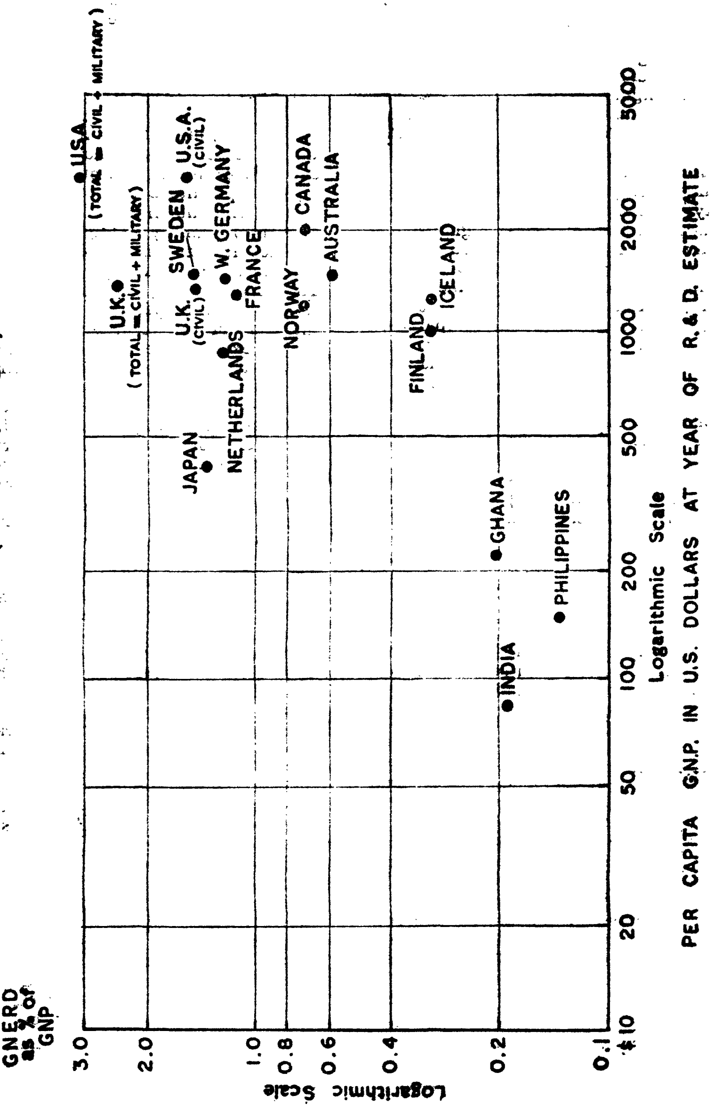
[1] Thus, for example, the US expenditure on higher education was 0·26 per cent of the GNP in 1900. It rose to 1·23 per cent in 1960. The expenditure, per year per student, in higher education rose from $ 574 in 1930 to $ 1,747 in 1960 (at current prices). The increased cost accounts for rise in salaries of teachers, better staff-student ratio and improvement in general facilities. (F. Machlup, *Production and Distribution of Knowledge in the U.S.*, Princeton University, 1962, p. 78)

RESEARCH & DEVELOPMENT EXPENDITURE IN RELATION TO PER CAPITA G.N.P.

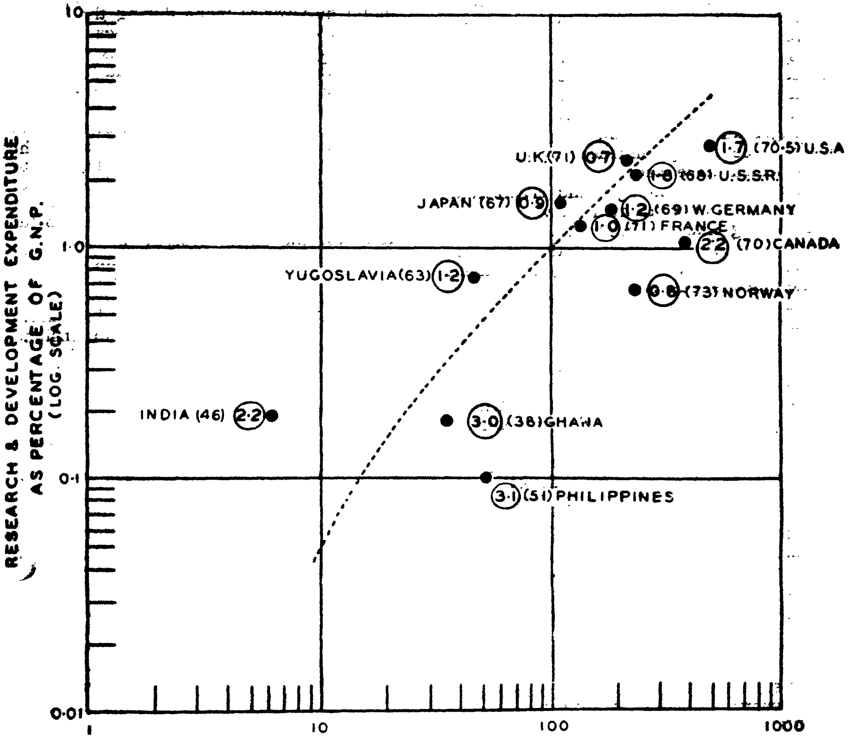
AT MARKET PRICES 1961 (OR NEAREST YEAR)



Source: SCIENCE, ECONOMIC GROWTH & GOVERNMENT POLICY. OECD. PARIS. 1963.

[1 $ = Rs. 4.76]

INVESTMENT IN SCIENCE VERSUS INVESTMENT IN MAN



EXPENDITURE ON EDUCATION PER CAPITA (IN RUPEES)
(LOG SCALE)

NUMBER IN BRACKET INDICATES EXPECTANCY OF LIFE (IN YEARS) AT BIRTH.
FIGURE IN CIRCLE INDICATES THE RATE OF INCREASE OF POPULATION (1958-61) PERCENT PER YEAR

(NOTE:— 1 $ = Rs. 4·76)

impossible of attainment in the foreseeable future, but because of its irrelevance to our needs and aspirations.[1]

16.14. If science is to be pursued with full vigour and zest and is to become a mighty force in the Indian renaissance, it must derive its 'nourishment' from our cultural and spiritual heritage and not bypass it. Science must become an integral part of our cultural fabric. It is possible that when science takes root in the native soil, and is no longer an exotic plant, its growth pattern may be visibly influenced by those features which have been characteristic of Indian philosophic thought and civilization. Part of the science 'fashion' may be set by us reflecting Indian ethos and value judgements. Let us also remember that thinking and creativity have a considerable element of the preconscious. All is not well with the way science has developed in the western world (or rather the 'northern world'). There are people who are seriously perturbed by the imbalance between the growth of science and awareness of the true interests and welfare of mankind as a whole. Knowledge and wisdom, power and compassion, are out of balance. Max Born, one of the greatest physicists of our time has given expression to these fears and doubts thus: 'Though I love science I have the feeling that it is so much against history and tradition that it cannot be absorbed by our civilization. The political and military horrors and the complete breakdown of ethics which I have witnessed during my life may be not a symptom of an ephemeral social weakness, but a necessary consequence of the rise of science—which in itself is one of the highest intellectual achievements of man. If this is so, there will be an end to man as a free, responsible being. Should the race not be extinguished by a nuclear war it will degenerate into a flock of stupid, dumb creatures under the tyranny of dictators who rule them with the help of machines and electronic computers'[2].

SCIENCE EDUCATION

16.15. While science is expanding at a terrific pace, till very recently even in the educationally advanced countries, little attention was paid to any serious improvement and innovation in the teaching of science and mathematics. In particular, school and college mathematics has been grossly out of date, in content as well as in method and approach, and takes no account of the profound discoveries made during the last 100 years or more. In the last decade the US National Science Foundation, as also the Soviet Academy of Sciences and the Academy of Pedagogical Sciences, have made a pioneering contribution towards initiating a 'revolution' in the teaching of science and mathematics. A significant contribution has also been made by the Nuffield Science Foundation which has developed new curriculum materials at the school level. The movement is now spreading to many countries. Fortunately for the entire process of improving school and college science and mathematics, top university teachers and researchers have become directly involved in this process. The contribution of Professor Jerrald R. Zacharias of the M.I.T., Boston, will, for instance, ever remain memorable in this field.

16.16. In this context it is important to recognise that science is becoming increasingly complex and abstract. The new developments in physics and mathematics make altogether novel demands on abstraction and conceptualization of nature. Referring to the progress in theoretical physics during recent years, P.A.M. Dirac observes: 'Her (Nature's) fundamental laws do not govern the world as it appears in our mental picture in any very direct way, but instead they control a substratum of which we cannot form a mental picture without introducing irrelevancies.... This state of affairs is very satisfactory from a philosophical point of view, as implying an increasing recognition of the part played by the observer in himself introducing the regularities that appear in his observations, and a lack of arbitrariness in the ways of nature, but it makes things less easy for the learner of physics. Like the fundamental concepts (*e.g.*, proximity, identity) which every one must learn on his arrival into the world, the newer concepts of physics can be mastered only by long familiarity with their properties and uses.'

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[1] The current output of doctorates in science and technology in the USA exceeds the output of M.Sc.s in our country. The number of new Ph. Ds. in physics in the USA was about 700 in 1963; and the total stock of Ph. D. physicists 7,630. The total support for basic physics in 1963 was about $ 500 million. The NAS Panel Report (*Physics: Survey and Outlook 1966*) has urged that this be raised to 1·1 billion dollars by 1969. The number of science and engineering doctorates awarded in 1920 in the USA was 400 : it rose to 6,600 in 1960 and is expected to exceed 13,000 by 1970. This implies a doubling every 12 years.

[2] *Bulletin of the Atomic Scientists*, Feb. 1966.

16.17. All this emphasizes the need from the earliest stage of science education for a proper understanding of the basic principles and the process of scientific abstraction and creative thinking. It must communicate to the pupils a feeling for discovery and creativity, and a realization that science is open-ended and man's greatest intellectual enterprise today. And what is more important, this enterprise is rooted in man's highest aspirations and deepest motivations, and it stresses co-operation above competition. Science teaching at all levels has to be creative teaching. It also means that a deliberate effort should be made to develop in the pupils the habits of concentration and contemplation. If the quality of education has to be improved, something will have to be done to each of the millions of individual pupils; and this emphasizes the importance of activising and renovating every individual teacher. The magnitude of the problems we face is truly immense.

16.18. **Expansion of Enrolments: Supply of Teachers.** In recent years, and more so since independence (1947), the number of young people graduating in science and technology in India has been increasing rapidly.[1] This is a welcome trend. It represents a growing awareness and desire for education in science and science-based courses. It is also stimulated by the larger possibilities of profitable employment open to graduates in science and technology. The number of people who received B.Sc. degrees in science subjects in 1963 was 31,638 as against only 9,628 in 1950. The corresponding figures for engineering and technology are 9,227 and 1,660 and for agriculture (including veterinary science) 4,872 and 1,100 respectively. The number of doctorate degrees in science and technology has increased during this period from about 100 to 540.

16.19. Let us see how these outputs compare with the total population in the relevant age groups. It is sometimes helpful in discussing manpower problems, and making international comparisons, to view the output (and also the input) as a percentage of the corresponding age group. The average age at which the B.Sc. degree in science subjects is taken is about 20 years. This may be regarded as the median age and the age distribution is likely to have a variance of about a year. The M.Sc. degree in science subjects is taken at about 22 years, and the first degree in engineering and technology at about the same age. It may be noted that as regards the total duration of the course after completion of secondary education, *it is our M.Sc. degree in science which should be equated to the first degree (Bachelor's degree) in engineering, technology and agriculture.* The average age at which a doctorate degree is received may be taken to be about 26 years, but the variance in the age distribution will be much more than for the bachelor's degree.

16.20. The actual number of degrees awarded in 1950 and 1963, expressed as percentage of the corresponding age group, are given in Table 16.1.

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[1] Science teaching in India first began, it seems, in the Calcutta Hindu College (which later became the Presidency College) founded in 1817 due to the inititative of Raja Rammohan Roy. It took a hundred years before serious postgraduate work and research started in the country. An outstanding event was the establishment of the Calcutta University College of Science under the leadership of the late Sir Asutosh Mookerjee.

The scientific revolution started in Western Europe some three hundred years ago, but it is less than a hundred years that science found a proper home in the universities of the Western world. In 1858 Michael Faraday urged : 'As a branch of learning, men are beginning to recognize the right of science to its own particular place; (but) now the fitness of university degrees in science is under consideration, and many are taking a high view of it, as distinguished from literature, and think that it may well be studied for its own sake, *i.e.*, as a proper exercise of the human intelligence, able to bring into action and development all powers of the mind'. (*Proceedings of the Royal Institute*, London, 1858).

The Indian Education Commission Report of 1882 records that in that year ,in all subjects, 266 Bachelor's degrees and 40 Master's degrees were awarded. Incidentally, the *failure* rate at the Bachelor's examinations at that time was about the same as generally prevailing in India today : it was about 60 per cent.

As a sharp reminder of the relative backwardness of Indian education it may be noted that in the year 1880 in the USA 12,896 Bachelor's and first professional degrees, 879 Master's or second professional degrees, and 54 Doctorate or equivalent degrees were awarded. The U.S. population in 1880 was about 50 million (F. Machlup : *Production and Distribution of Knowledge in the United States*, Princeton University, 1962, p. 91.), TABLE 16·1. DEGREES AWARDED IN SCIENCE AND TECHNOLOGY IN 1950 AND 1963

Degrees	Number of degrees awarded		Percentage of the corresponding age-group		Average (compound) rate of growth per year
	1950	1963	1950	1963	
B.Sc.	9,628	31,638	0·14	0·37	9·6%
M. Sc. . . . . (excluding Mathematics)	861	4,478	0·013	0·055	13·6%
M.A./M.Sc. (Mathematics)	251	1,857	0·004	0·023	16·6%
Bachelor's degree in Technology (Engineering and other subjects)	1,660	9,217	0·026	0·11	14·1%
Bachelor's degree in Agriculture and Veterinary Science	1,100	4,872	0·017	0·060	12·1%
Doctorate degree in Science and Technology . .	100	540	..	..	13·9%

Source. - University Grants Commission, *University Development in India* 1964-65.

16.21. The output of M.Scs. in different science subjects in Indian universities since 1950 is given in Table 16.2. It may be noticed that the current output of M.Sc. in our country is *less* than the output in the USA of *doctorates* in science and technology. The number of doctorates in science and engineering awarded in the USA rose from 400 in 1920 to 6,600 in 1960 and is expected to exceed 13,000 by 1970. This implies a doubling every twelve years. The current output of graduates in science and technology in the USA is about four per cent of the relevant age-group—it is about equally divided between the two fields. The percentage for the USSR is nearly the same, but the proportion of engineers is far more than scientists.

16.22. Apart from improving the standard of the postgraduate courses, the postgraduate enrolments in science and mathematics would need to be expanded *several fold* in the coming decades to meet the demands of rapidly expanding secondary and higher education and of research and industry. We envisage an annual rate of increase of about 10 to 15 per cent. This would mean, that at the end of two decades, the numbers would be about ten times the present enrolments. To achieve such a large-scale expansion without diluting standards in the process is an extremely difficult task. It will require bold action and careful planning. It will need a massive financial support (including foreign exchange component) for the construction and equipping of new laboratories, and a most energetic and determined effort on the part of all concerned to recruit and train the teaching staff. The recruitment of new teachers every year will have to be at the rate of some 20 per cent of the current strength in order to meet the demands of increasing enrolments, present shortages, and replacements due to retirement and other causes. This places a special obligation on the Centres of Advanced Study and other quality departments and institutions. Through provision of liberal scholarships at the postgraduate and research level and other incentives, it should be ensured that *at least* a half of the output of the Centres join the teaching profession. The Academic Planning Board which we have elsewhere[1] recommended to be set up in every university, should assume a special responsibility for advanced planning of the requirements of academic staff: it should keep in touch with the relevant centres of advanced study, and wherever possible to preselect would-be staff members and arrange for their special training. There is always a scarcity of outstanding persons in any profession, and if anything it is more accentuated in science and mathematics. The top ranking professionals are the nation's most precious asset, and everything possible should be done to use them to the best advantage of the country. An institution which has an outstanding staff should be encouraged to organize short-period special courses (from a few weeks to months)

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[1] See Chapter XIII.

TABLE 16·2. OUTPUT OF M. Sc. s (1950 to 1963) IN BASIC SCIENCE SUBJECTS

Subject	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963
Chemistry	283	346	353	400	482	556	597	648	724	881	1,064	1,132	1,240	1,487
Mathematics	121	180	233	253	399	437	475	601	572	731	687	855	1,002	1,094
Physics	231	291	336	384	444	425	473	484	537	618	760	921	1,076	1,101
Botany	82	115	137	156	172	234	270	286	265	366	418	473	553	632
Zoology	115	124	159	190	195	241	257	249	263	334	434	526	567	648
Geology	64	91	95	83	109	84	109	134	182	228	267	365	336	418
TOTAL .	896	1,147	1,313	1,466	1,801	1,977	2,181	2,402	2,543	3,158	3,630	4,272	4,774	5,380

NOTES.—1. Chemistry includes (*a*) Applied Chemistry, (*b*) Analytical Chemistry, and (*c*) Biochemistry.
2. Mathematics includes Astronomy.
3. Physics includes (*a*) Bio-Physics and (*b*) Meteorology and Oceanography.
4. Geology includes (*a*) Applied Geology, (*b*) Geo-Physics, and (*c*) Physics of the Earth.

The overall increase in the output of postgraduates in basic sciences has been 120·6 per cent during 1950-55, 83·6 per cent during 1955-60 and 48·2 per cent during 1960-63. The detailed subject-wise break-up is given below.

Subject	Percentage increase over five year periods		
	1950-51	1955-60	1961-63
Chemistry	96·5	91·4	39·9
Physics	84·0	78·8	44·9
Mathematics	261·2	57·2	59·2
Botany	185·4	78·6	51·2
Zoology	109·6	80·1	49·3
Geology	31·3	217·9	56·6
ALL THE ABOVE SUBJECTS . .	120·6%	83·6%	48·2%

Source. Basic Facts and Figures, University Grants Commission.

to which selected students (and also teachers), from other parts of the country would be invited. Also, it would be a distinct advantage if some of the distinguished teachers of our university spend a part of their time (say, a couple of months in a year) at other universities interested in their line of speciality. We understand that the UGC has a scheme for exchange of teachers. We recommend that the scheme be enlarged in scope and an adequate financial support given to it.

16.23. We have in an earlier chapter expressed our strong support of the concept and scheme of the Centres of Advanced Study. In this programme valuable assistance has been provided by the USSR through UNESCO. Some of the Centres have made commendable progress, but there are many where we are not wholly satisfied by the progress made so far. We understand that this matter is under special review by the UGC. If the Centres of Advanced Study are to fulfil their role in setting standards of teaching and research, and in the training of future teachers, it is essential that the level of the academic staff at the Centres is of the highest quality. It should, wherever possible, include some persons of international standing to provide inspiration and leadership. It will be most desirable to provide a number of visiting professorships on contract appointments for a period of two to three years. It may be a distinct advantage to have an all-India Committee constituted by the UGC to make offers of visiting professorships. Under this scheme we could invite some of the internationally famous Indian scientists at present working abroad as well as distinguished foreign scientists. Their pay scales and other conditions of service, including provision of residential accommodation, will have to be fixed at a suitable level. The professors under the scheme would be assigned to universities in consultation with them. To begin with, the number of such visiting professors could be limited to about fifty in all science subjects including mathematics.

16.24. **Regional Imbalances in Science Education.** In the context of expansion of science education it is important to draw attention to the wide variation as regards facilities amongst the different States in the country. In this connection, attention is invited to Table 16.3 and the chart on page 301. It will be seen therefrom that the enrolment in science courses, expressed per unit of the total population is the highest in the southern States. The lowest is in the State of Rajasthan: it is about 500 per million of the population as compared to the highest figure of 2,200 per million in Kerala. This regional imbalance in science education and even more so in technology is a matter of serious concern. It has a direct effect on the pace of industrial development. Deliberate efforts should be made to raise the enrolments in science and technology in States in which it is at present substantially below the all-India average. Also, it is important that there is an adequate matching between the industrial and agricultural development and potential of a region on the one hand and the availability of facilities for education in science, technology and agriculture on the other. The universities can and should play an increasingly significant role in the general development of the region in which they are located; and this is particularly important for universities situated in the less developed parts of the country. By suitably orienting their courses of study specially in science and technology, by a careful selection of research projects, and by adequate stress on field studies and extension work, the universities can exert a powerful impact on the economic and cultural development of the regions in their neighbourhood and of the country generally.

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[1] Chapter XIII.

TABLE 16·3. UNIVERSITY ENROLMENT IN INDIA : STATE-WISE AND FACULTY-WISE (1964-65)

State	Arts	Science	Commerce	Education	Engg-tech	Medicine	Agriculture	Vet. Sc.	Law	Others	Total
Andhra	18,181 (23.1)	37,083 (47·1)	5,526 (7·0)	1,487 (1·9)	6,169 (7·8)	6,915 (8·8)	1,181 (1·5)	626 (0·8)	1,291 (1·6)	312 (0.4)	78,691 ..
Assam	32,667 (67·9)	9,464 (19·6)	2,367 (4·9)	391 (0·8)	967 (2·0)	1,117 (2·4)	391 (0·8)	246 (0·5)	527 (1·1)	.. ..	43,197 ..
Bihar	61,253 (53·8)	31,670 (27·8)	5,774 (5·1)	1,042 (0·9)	6,632 (5·8)	2,941 (2·6)	1,089 (0·9)	650 (0·6)	2846 (2·5)	6 ..	1,13,903 ..
Gujarat	30,966 (37·0)	24,289 (29·0)	12,329 (14·7)	1,148 (1·4)	6,019 (7·2)	3,686 (4·4)	1,241 (1·5)	100 (0·1)	3,319 (3·9)	690 (0·3)	83,787 ..
Jammu & Kashmir	5,176	5,237	235	420	971	650	334	..	..	..	13,023
Kashmir	(39·7)	(40·2)	(1·8)	(3·2)	(7·5)	(5·0)	(2·6)	..	..	..	..
Kerala	28,632 (34·3)	40,978 (49·1)	3,590 (4·3)	2,450 (2·9)	4,008 (4·8)	2,734 (3·3)	284 (0·4)	252 (0·3)	524 (0·6)	.. ..	83,452 ..
Madhya Pradesh	36,696 (41·0)	23,226 (26·0)	10,833 (12·1)	2,326 (2·6)	6,062 (6·8)	4,202 (4·7)	1,356 (2·1)	492 (0·6)	312 (3·5)	420 (0·5)	89,264 ..
Madras	23,002 (26·1)	41,673 (47·2)	5,697 (6·4)	1,828 (2·1)	6,580 (7·5)	6,013 (6·8)	988 (1·1)	705 (0·8)	1,161 (1·3)	631 (0·7)	88,278 ..
Maharashtra	59,363 (35·7)	51,632 (31·1)	29,519 (17·7)	3,725 (2·2)	5,781 (3·5)	6,844 (4·1)	3,909 (2·4)	361 (0·2)	5,050 (3·0)	100 (0·1)	1,66,334 ..
Mysore	16,703 (23·3)	29,855 (41·7)	6,058 (8·5)	1,371 (1·9)	8,340 (11·6)	6,040 (8·4)	967 (1·3)	437 (0·6)	1,905 (2·7)	.. ..	71,676 ..
Orissa	11,826 (43·5)	8,625 (31·7)	786 (2·9)	611 (2·2)	1,856 (6·8)	1,841 (6·8)	970 (3·6)	259 (1·0)	428 (1·5)	.. ..	27,202 ..
Punjab	39,900 (50·0)	17,749 (22·2)	1,581 (2·0)	4,069 (5·1)	7,884 (9·9)	4,832 (6·1)	2,023 (2·5)	386 (0·5)	983 (1·2)	423 (0·5)	79,830 ..
Rajasthan	16,614 (40·9)	9,898 (24·4)	6,656 (16·5)	1,425 (3·5)	1,434 (3·5)	1,911 (4·7)	1,372 (3·4)	180 (0·4)	1,101 (2·7)	.. ..	40,591 ..
Uttar Pradesh	1,51,335 (45·3)	1,01,219 (30·3)	24,332 (7·3)	4,710 (1·4)	7,560 (2·5)	5,596 (1·7)	27,029 (8·1)	864 (0·3)	5,230 (1·5)	6,247 (1·8)	3,34,122 ..
West Bengal	88,309 (49·2)	42,906 (23·2)	30,017 (16·8)	2,284 (1·3)	6,843 (3·8)	4,199 (2·3)	594 (0·3)	153 (0·1)	3,778 (2·1)	363 (0·2)	1,79,446 ..
Delhi	20,536 (67·6)	3,229 (10·6)	2,489 (8·2)	241 (0·8)	1,008 (3·3)	2,161 (7·1)	..	..	705 (2·3)	35 (0·1)	30,431 ..
TOTAL	6,41,186 (42·0)	4,78,702 (31·3)	1,47,789 (9·7)	29,528 (1·9)	78,114 (5·1)	61,742 (4·0)	44,228 (2·9)	5,711 (0·4)	32,000 (2·1)	9,227 (0·6)	15,28,227 ..

* Including enrolment in Intermediate Boards.

Source. University Development in India, University Grants Commission. (These enrolments will not tally with those given in Chapter XII because of the different basis adopted.

16.25. **Curriculum Reform.** There is an urgent need, in general, of revising drastically the undergraduate and postgraduate curricula. The UGC has brought out reports of its Review Committees in mathematics and other science subjects which give an account of the courses provided by the universities, and make specific recommendations for the improvement of curricula. The Reports deal also with university research. The recent UNESCO studies, such as *A Survey of the Teaching of Physics at Universities* (1965), prepared under the auspices of the International Union of Pure and Applied Physics, provide valuable information about the level and contents of university courses in some of the scientifically advanced countries.

16.26. We would like to stress the extreme importance of field work and environmental studies in biological and earth sciences. The study of natural and semi-natural plant population deserves special attention. It is relevant to the breeding of new crops resistant to plant diseases and climatic extremes. A foreign botanist who recently visited our universities, while expressing satisfaction that many students were studying botany, remarked that 'most of the subject matter they learn in the university botany courses is absolutely useless to them'. Industrial and agricultural applications of science subjects should be clearly and forcefully brought out and illustrated in terms of local industries and experience accessible to students. A frequent criticism of geological education in our country relates to lack of adequate field training. The earth materials, processes and historical events should be observed in their natural associations and in the field. Adequate time should be devoted to field training in an intensive way; and it should cover experience with the greatest possible variety of geological materials and phenomena. Field training should be continuous over a period of at least two months in a year. It would be an advantage to link field training, wherever possible, with work and programmes of the National Geological Survey. That would make the training realistic and useful. As regards museum collections, there is usually a good set of foreign specimens but relatively little of Indian collection. Indian specimens could be readily prepared on the basis of an exchange service operating between our geology departments. Topographic and geologic maps of typical areas in India are also not generally available in most departments. Again, subjects like geochemistry, geophysics and geomagnetism and economic geology are of great importance in the exploitation of the natural resources and should be emphasized in the training of geologists. In the field of biology, the study of micro-organisms and their role in medicine and agriculture deserves much more attention than is generally the case. Universities and colleges should make full educational use of museums, public botanical gardens and zoos and scientific and industrial institutions.

16.27. It is important that in our physical science departments a proper balance between experimental and theoretical aspects is maintained. For instance, it is quite common for physics departments to do a lot of theoretical work without any reference to or contact with experimental work in the same field. Special and urgent attention should be paid to the development of experimental physics and chemistry. In the field of chemistry studies in areas such as synthetic chemicals, fertilizers, pesticides, chemistry of natural products, petrochemicals and synthetic fibres, pharmaceuticals and dyestuffs should be more practical-based and in close relation to industry. Astronomy and astrophysics also deserve special attention and support in view of current developments of far-reaching importance. India's contribution in this field has been outstanding. The name of M. N. Saha immediately comes to mind.

16.28. **Workshops in Science Departments.** There should be well-equipped workshops in every college and university department of science. Students should be encouraged to learn the use of workshop tools and get acquainted with some of the essential laboratory techniques and practices *e.g.*, glass-blowing, metal work, carpentry, coil winding, photographic techniques and making of projection slides, soldering and welding, electrical circuitry and wiring; and general maintenance and repair of mechanical and electrical equipment used in laboratories. This training would be specially useful to those of them who become teachers. It will help them to carry out ordinary laboratory repairs and to improvise and fabricate simple apparatus. The workshops should work far more intensively than is usually the case. It would be desirable to permit their use by industrial workers enrolled for evening and correspondence courses.

16.29. **Practical Work.** In connection with experimental work of undergraduate and postgraduate students, special attention needs to be paid to improve the quality of practical work and to integrate it with the learning of theory. It would be of good value to provide, specially at the postgraduate stage, a short course in basic laboratory techniques and workshop practice. A certificate of workshop training could be issued to students who reach a certain level of proficiency. Students in all science subjects should have some knowledge of the theory of errors, basic statistical concepts and statistical design of experiments. It is widely felt that terminal practical examinations as generally conducted hardly serve any useful purpose. These should be dispensed with and replaced by assessment of the students' performance in the laboratory throughout the academic year. The evaluation should be completed every term by the teacher in charge of practicals: and a satisfactory performance should be an essential requirement for taking the terminal (written) examinations.

16.30. **Inter-disciplinary Studies.** As pointed out earlier in Chapter XII, there is an urgent need to introduce an element of flexibility and innovation in the organization of our courses for the Master's degree because several border-line and inter-disciplinary subjects are rapidly developing as areas of major study and research. In this context, and also apart from it, it would be useful to provide, in addition to our present 'one subject' M.Sc. courses, *combination courses* consisting of, say, one major subject and one subsidiary or contextual subject. For instance, combination courses in mathematics and physics, chemistry and geology, life sciences and physics, mathematics and economics, would be of great value and interest. Such courses should be organized jointly by the departments concerned. It is important to break the prevailing rigidity and deadening uniformity, as also the barriers between departments within the same university.

16.31. It will be a great advantage if major departments in life sciences have on their academic staff a small number of physical scientists (including mathematicians) specially selected for their interest in the study of biological phenomena. The physical scientists could be on deputation from their parent departments: and there could be also joint appointments between two departments. Similarly, selected members from departments of life sciences could be on deputation to departments of physical sciences. Again, science departments, specially physics and mathematics, will benefit immensely by close association with engineers with research interests. A course, say, in electricity and magnetism, electronics or material science, if given jointly by physicists and engineers can be most stimulating and effective. The need of the day is to bring science and technology closer together in our educational system. As J. A. Stratton (former President of the MIT, Boston) has observed: 'there could be no greater disservice to the cause of science and engineering than to set one against the other' and thus cause a cleavage between the two.

16.32. **Special Courses.** Apart from the regular two-year M.Sc. courses there is need to provide one-year courses, or of even shorter period, for specialized training in subjects relevant to present scientific, industrial and other needs. These courses could be provided by selected science and technology departments in universities, engineering and agricultural institutions or the National Laboratories. An illustrative list of such courses is given below:

Initial qualification B.Sc. degree	Initial qualification M. Sc.or B.E. degree
Agricultural Chemicals	Quantum Eectronics
Antibiotics	Analytical Chemical Techniques
Bacteriology	Applied Mechanics
Biochemical Techniques	Biophysics
Electrochemistry	Coherent Radiation
Electronics	Computer Technology
Elementary Applied Optics	Dyestuff Technology
Fisheries	Electron Microscopy
Forest & Forest Products	Experimental Psychology
Genetics	Geochemical Techniques
Insect & Pest Control	Geophysical Prospecting
Instrumentation (General)	Health Physics
Isotope Techniques	High Polymers
Laboratory Techniques (General)	History of Science
Metallurgy	Nutrition
Mineral Prospecting	Operational Research
Plant Breeding	Petrochemistry
Plastics	Environmental Sanitation
Refrigeration	Radiation Biology
	Rocket Technology
	Seismic Studies
	Soil Physics
	Materials Science
	Semi-conductors
	Thermodynamics of Irreversible Processes

16.33. The admission qualifications for these courses would be B.Sc., M.Sc., or first degree in engineering depending on the course: Those who successfully complete a course would be awarded a certificate (if the course is of a few months) or a diploma. Some of the courses may be suitable for a B. Phil. degree described below.

16.34. **Part-time Education in Science Subjects.** As one of the important steps towards linking education with practical life, it would be desirable for universities and engineering institutions to enrol qualified industrial workers for part-time education in science and technology through evening (or early morning) classes and correspondence courses. Apart from the usual diploma and degree courses, special certificate courses to train precision mechanics, laboratory technicians and other skilled operators could be organized. There is a considerable shortage at present of laboratory mechanics and middle-level technicians.

16.35. **A New Academic Degree.** There is a need, in view of the rapid increase of scientific knowledge and development of border-line subjects, for the introduction of a new degree beyond the M.Sc. stage[1]. This, unlike the Ph.D., would be essentially a degree by examination, though it may include a short dissertation in lieu of a written paper. The course could include with advantage, on an optional basis, elements of pedagogy. The normal period for taking the degree would be two years, but in special cases exemption of a year may be granted. The degree may be called B. Phil as at Oxford (or M. Phil as at Yale). This degree should not be regarded as a necessary requirement for proceeding to the Ph.D., though in some cases it would certainly be an advantage to take this degree first. It may be possible for some departments which are unable to provide work up to the Ph.D. level to enrol students for the B.Phil. It could be amongst other things a useful training for would-be teachers. It would also facilitate movement of research students from one university to another, completing B. Phil at one place and D.Phil at another institution.

16.36. Before we proceed to discuss problems of university research we would like to refer briefly to the programme of summer science institutes and one or two other items of general interest.

16.37. **Summer Science Institutes.** A programme specially designed for the improvement of science education at the secondary school and undergraduate levels relates to the organization of the summer science institutes initiated in 1963 by the University Grants Commission and the National Council of Educational Research and Training with the support of the USAID and the National Science Foundation (USA). The programme is directed towards the activisation and improvement of the subject-matter competence and scientific background of teachers of schools and colleges. The number of science institutes has increased from four in 1963 to more than eighty in 1966. About 6,500 school teachers and 3,500 college teachers have so far attended the institutes. A striking feature of the summer institutes is that it brings together in active participation school and college teachers, and leading university professors. The programme of summer institutes is a major instrument in the country's effort towards the improvement of science education in schools and colleges. The UGC and the NCERT have under consideration an extensive follow-up programme of the summer institutes with the support of the US National Science Foundation.

16.38. **Books in Science.** It is unfortunate that most of the quality books in science and technology even at the undergraduate stage are still very largely imported. All imported books are not quality books. A large-scale import of textbooks in science and technology is not only expensive and costs foreign exchange, but it is bad for our intellectual morale. The country has the talent and other resources required to produce first-rate books, but it appears that what is lacking is determination and planned effort. The Inter-University Board and the UGC should take a lead in the matter so that by the end of the fourth plan most of the books required at the undergraduate level and a considerable number at the postgraduate level are produced within the country. It is important that learned and professional societies in the country lend active support and encouragement to the preparation of outstanding books and monographs, and give high professional recognition to such work—it should enjoy a status accorded usually to research.

16.39. **Scientific Terminology.** In this context a reference may be made to scientific and technical terminology in the Indian languages. Such a terminology is necessary for the writing of science material and textbooks in these languages. The Ministry of Education appointed, about five years ago, a Standing Commission on Scientific and Technical Terminology. The Commission works in close association with the universities and professional bodies concerned with scientific terminology. It has published standard glossaries in Hindi of scientific terms required at the school stage. In some science subjects glossaries have also been published for use at the first degree level. The Commission has followed the sound and practical codes of adopting in Hindi and other regional languages the current English forms of international terms *e.g.*, names of units, chemical elements and compounds, as also mathematical signs and symbols. Scientific and technical terms which stand for concepts are translated into Hindi and other Indian languages, every attempt being made to have the same word in different languages. What the Commission has recommended and done in relation to Indian languages is in accordance with the standard practice in almost all countries. The present international vocabulary of science comprises a few million items, and a very large part of it relates to chemical compounds and medical terms. The vocabulary is mainly based on a thousand Greek and Latin roots. For students of science, specially medicine, it is a great advantage to learn a couple of hundred frequently used Greek and Latin roots which serve as bricks for word building in science. We suggest that this should be made a part of the curriculum. L. Hogben writes (*The Mother Tongue*, London 1964: 'To use his emotionally neutral language of science intelligently, and to add to its stock-in-trade, we do not need to be proficient in Greek or in Latin; but we do need to know a few hundred current roots derived from Greek words and a few hundred from Latin words with the meaning they now have by general consent in current speech. Unless we have such knowledge, we shall miss useful clues to meaning and we shall adopt or coin meaningless new words.'

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[1] What is said here can also apply, *mutatis mutandis*, to degrees in the social sciences.

SCIENTIFIC RESEARCH

16.40. **Scientific Research and National Prosperity.** In the modern world, scientific research constitutes a fundamental activity of a nation, vital to its progress, intellectual morale and well-being. The close interaction between expenditure on research and development and the level of per capita GNP is apparent from a glance at Tables 16.4 and 16.5. The figures for consumption of commercially produced energy per head of population provide a useful index of industrial development. Education and research are not only the fruits but also the seeds of industrial development.

TABLE 16·4. EXPENDITURE ON RESEARCH AND DEVELOPMENT AND GNP (1960)

Country	Expenditure on research and development (1960)		Consumption of commercially produced energy per capita (1960) (tons equivalent coal)	GNP Dollars per capita
	Percent of GNP	Dollars per capita		
U.S.A.	2·8	78·4	8·0	2308·0
U.S.S.R.	2·3	36·4	2·9	..
U.K. (1961)	2·7	35·4	4·9	1146.0
France	2·1	27·0	2·5	1026·0
Sweden	1·6	27·0	3·5	..
Canada	1·2	21·9	5·6	1408·0
W. Germany	1·6	20·0	3·6	1115·0
Switzerland	1·3	20·0	1·9	1463·0
Netherlands	1·4	13·5	2·8	859·0
Norway	0·7	10·0	2·7	..
Luxembourg	0·7	9·3	..	..
New Zealand	0·6	8·9	2·0	1317·0
Belgium	0·5	7·5	4·1	1030·0
Japan	1·6	6·2	1·3	404·0
Hungary	1·2	..	2·5	..
Poland	0·9	5·3	3·2	..
Australia	0·6	5·3	2·2	1239·0
Italy	0·3	1·8	1·2	623·0
Yugoslavia	0·7	1·4	0·9	223·0
China	..	0·6	0·6	..
Ghana	0·2	0·4	0·1	198·0
Lebanon	0·1	0·3	0·7	..
Egypt	..	0·3	0·3	138·0
Philippines	0·1	0·3	0·2	200·0
India	0·1	0·1	0·1	69·0
Pakistan	0·1	0·1	0.1	54·0

Source. Taken from *Underdeveloped Science in Underdeveloped Countries*, Stevan Dedijer, *Minerva*, Autumn, 1963.

The current level of expenditure on research and development in India is about one rupee per capita, nearly 0.3 per cent of the GNP. It will be seen that India is almost at the bottom end of the 'international ladder' of R & D effort expressed as a percentage of the GNP. This will be seen in the chart on page 390. In making comparisons between highly industrialized and under-industrialized countries, it should be remembered that, in poor countries, the GNP is not much beyond the level of bare subsistence; and the 'surplus' left after meeting the minimum needs of the people for food, clothing and shelter is a very small portion of the total GNP.

16.41. **Investment in Research.** In an age characterised by science and technology research is almost a necessary precondition for all kinds of human endeavour. In the industrially advanced countries the growth of investment in research and development, and of manpower engaged in these activities, has surpassed all expectations. This will be seen from Table 16.5.

TABLE 16.5. ESTIMATED GROSS EXPENDITURE ON RESEARCH AND DEVELOPMENT (GERD) AND GROSS NATIONAL PRODUCT (GNP), 1962

	United States	Western Europe(¹)	Belgium	France	FR Germany	Netherlands ..	United Kingdom
GERD in National Currency (millions)	17,531	..	6,625	.430	4,419	860	634
GERD in $ US (millions official exchange rate)	17,531	4,360	133	1,108	1,105	239	1,775
GNP at market price (²) in national currency (millions)	557,590	..	646,200	356,300	354,500	48,090	28,566
GERD as % of GNP at market price .	3·1	..	1·0	1·5	1·3	1·8	2·2
Population (millions)	187	176	9	47	55	12	53
R and D expenditure per capita (in $ U.S.)	93·7	24·8	14.8	23·6	20·1	20·3	35·5

[1] Belgium, France, Germany, Netherlands, United Kingdom.

[2] If GNP is taken at factor cost instead of market price, the ratios are as follows:

United States	3·5%
Belgium	1 2%
France	1·8 %
Germany	1·5%
Netherlands	1·7%
United Kingdom	2.5%

Source . The OECD Observer, Special issue on Science, February, 1966. p. 11.

The total expenditure on research and development is between about 1 to 3 per cent of the GNP. It may also be pointed out that in some of the countries the research and development expenditure has increased nearly four-fold over the past decade. France spent 1.8 per cent of the GNP on research and development in 1962 and it is expected to go up to 2.5 per cent by 1970. Also, over the same period the number of people employed in scientific work and higher education is likely to be doubled. Such high rates of growth cannot obviously be sustained indefinitely. For example, in the USA during the last two years there has been a considerable slowing down of the R and D *growth rate*, but it is not certain whether it is only a temporary phase or an indication of an approach towards a state of equilibrium (saturation stage). Even highly industrialized countries will find it extremely difficult to provide for research and development a figure exceeding about 5 to 10 per cent of the GNP.

16.42. Recently there has appeared a most valuable study on the measurement of research and development effort in Western Europe, North America and the USSR (by C. Freeman and A Young, OECD, Paris 1965). A particularly significant feature of the Freeman-Young study is an attempt to estimate what they call a 'research exchange rate.' In the usual comparison of research and development expenditure in different countries, no account is taken of the fact that a given amount of money in one country does not generate the same research and development effort as in another country. In other words the *official exchange rate* is likely to differ markedly from what may be called the *research exchange rate*. Freeman and Young are unable, on the basis of available data, to provide precise figures, but as a tentative estimate the ratio of the American to the European research and development costs is about 1.5 to 2. The American costs as compared to the USSR are nearly 3 times as high.

16.43. It is interesting to observe that (in 1962, the year to which the study relates), about 60 per cent of the total R and D expenditure by the USA was for military and space research. The corresponding figure for the UK was about 40 per cent, for West Germany 10 per cent, and still lower for Belgium and the Netherlands.

16.44. We reproduce two tables from the *Freeman-Young Report* (Tables 16.6 and 16.7). These provide valuable insight into the structure and organization of research and development and underscore the connection between the percentage of the national income spent on research and development and the number of scientists and technologists expressed as a percentage of the total population. If one of them is high and the other low it cannot but lead to inefficiency and wastage. To do more science we need more scientists. Investment on research and education are inseparable. For instance, in 1920, the total USA expenditure on research and development was 0.1 per cent of the GNP; it rose to 0.5 per cent by 1940. The current figure exceeds 3 per cent. The total number of professionally qualified scientists and engineers (engaged in all types of activities including R & D) was about 0.6 per cent of the total labour force in 1940; the current figure is about 1.5 per cent and is expected to go up to 2 per cent by 1970. The Indian expenditure on R and D is 0.3 per cent of the GNP; and the total strength of scientists and engineers is only a few hundredths of one per cent of the labour force. (The number of qualified scientists and engineers is of the order of a hundred thousand).

TABLE 16·6. ESTIMATED GROSS EXPENDITURE ON RESEARCH AND DEVELOPMENT BY SECTORS OF ECONOMY: (1962)
(in percentages)

	Performance			Source of funds		
	Business enterprises	Higher education	Government and non-profit	Business enterprise	Higher education	Government and non-profit
United States	71	10	19	35	2	63
Western Europe	59	12	29	43	..	57
Belgium	65	13	22	63	..	37
France	48	14	38	30	..	70
West Germany	61	20	19	60	..	40
The Netherlands	60	14	26	65	..	35
United Kingdom	63	5	32	36	..	64

TABLE 16·7. ESTIMATED MANPOWER ENGAGED ON RESEARCH AND DEVELOPMENT (1962)

	Scientists and engineers engaged on R and D	Other personnel engaged on R and D	Total personnel engaged on R and D	Total population	Total working population (aged 15—64)	R & D personnel per 1,000 population	R & D personnel per 1,000 working population
	Thousand full-time equivalent	Thousand	Thousand	Million	Million		
United States	435.6	723.9	1,159.5	186.6	111.2	6.2	10.4
USSR (1)*	416·0	623·0	1,039·0	220·0	142·0	4·7	7·3
(2)	(487·0)	(985·0)	(1,472·0)			(6·7)	(10·4)
Western Europe	147·5	370·8	518·3	176·1	113·9	2·9	4·6
Belgium	8·1	12·9	21·9	9·2	6·0	2·3	3·5
France	28·0	83·2	111·2	47·0	29·1	2·4	3·8
Germany	40.1	102.1	142.2	54.7	56.7	2.6	3.9
The Netherlands	12·6	20·2	32·8	11·8	7·5	2·8	4·5
UK	58·7	152·4	211·1	53·4	34·8	4·0	6·1

*(1) 'Conservative' estimates; (2) including 'project' assumptions.

N.B. The population between the ages of 15 and 64 is a sector *capable* of doing productive work, but, of course, a large proportion is not actually working in this sense.

UNIVERSITY RESEARCH IN SCIENCE

16.45. We shall now turn to university research in science. It is unfortunate that we have less information about some essential aspects of university research than about almost any other major aspect of education. This lack of information is perhaps both a cause and an effect of the relative neglect of university research within the framework of the nation's research activities and education. We would like to stress that within the UGC organization an important place should be given to a continuous production of objective information, by the most advanced methods available, on university research in India and its impact on Indian society. Further, as science in its essential aspects is universal and supranational, in the formulation of a national research policy and its relation to educational policy it is important to make a systematic study and comparison with developments in other countries, and more significantly in the USSR, the USA, Japan, and the People's Republic of China.

16.46. A major weakness of Indian education and research is the relatively very small part played by the universities in the sum total of Indian research which itself is far smaller than what it should be in relation to our capabilities and needs. Before independence there was little provision for and little attention paid to research in the universities. The Government took little serious interest and provided hardly any encouragement even to the most outstanding of the scientists. In spite of all these difficulties some of the Indian contributions have been in the forefront of world science; but this serves only to highlight the general paucity and lack of research atmosphere in the universities. A stage has now been reached when deliberate support and encouragement of advanced study and research in the universities should become a fundamental goal of our national policy. This is central to the entire progress and development of science in the country.

16.47. **Research Function of Universities.** The research function of universities has many important aspects, and it has a powerful impact on the entire national life. Some major aspects can be summarised as follows:

(1) *Production of Researchers.* The university is the central place for the identification of research talent. It produces all or very nearly all the researchers of the country. It gives them basic training in research. Thus, the quality of national research depends to a very large extent on the quality of university research.

(2) *Performance of Research.* The universities in educationally advanced countries (but not in India today) do a very considerable portion of national research work, both in quantity and variety. The top leaders of science of a country are generally in the universities or work in the closest association with them.

(3) *Quality of Teaching.* Engagement in research work is a major pre-condition for creative teaching and stimulation of creativity.

(4) *Production of Teachers.* Since the universities produce their future teachers, and also for secondary schools, a developed research atmosphere in the universities has a direct bearing on the entire character and quality of teachers, and through them it influences the identification and development of their pupils.

(5) *Training of Leaders.* Leaders and decision-makers in nearly all fields of national life are now almost exclusively university trained. A major task of the universities is to impart to the country's future leaders an interest in the development of a scientific attitude in tackling the problems they are called upon to face in their work.

(6) *Consultative Function.* Through its research function, the university staff can and does provide advisory and consultative services to other institutions engaged in research, production, decision-making, etc. This should be vigorously encouraged in our country.

(7) *Research Policy.* In most countries it is the universities which supply the majority of advisory personnel for research policy bodies, including committees advising at the highest level of government.

(8) *Scientific Tradition.* The university staff play a key role in the development and improvement of the scientific tradition of the country, and in the organization and development of a socially aware and active scientific community. The university staff perform this function through their contacts and communication with each other, and with scientists outside the university. Through individual contacts and through student societies the teachers help to develop scientific tradition and proper norms of behaviour in the students—the scientific community of the future. Scientific societies of staff and students in university departments and colleges play an important role in promoting research interest and creativity in the youth.

(9) *International Contacts.* The academic bodies at a national level consisting largely of university scientists play a major role in promoting international contacts and understanding which often extend beyond the domain of science.

(10) *Government and Universities.* A healthy relationship between university and the Government is of vital importance in ensuring a balanced and fruitful interaction between Government and science generally.

16.48. The creative scientists and engineers of a country are one of its most precious and also scarce assets. These should be so developed as to generate a maximum 'multiplier effect'. The 'multiplier effect' of a top ranking scientist is generally maximum in a university: working in a university he contributes not only to scientific research but also to the building up of new talent—he serves as the focal point of inspiration and 'growing point' of young creative scientists. It is important that more and more university people—that is *teachers* and *students*—should perform more and more research work and of a better and still better quality. As an ultimate goal every university teacher in India should become a researcher, and every university researcher should become a teacher. Publication of quality research apart from good teaching ability, should become one of the basic criteria for advancement of teachers in their university career. Gifted students even at the undergraduate stage should be encouraged to participate in some form of research activity including field and project work and operational research type studies—special arrangements for the purpose could be made during vacations. A certain proportion of the bright M.Sc. and Ph.D. students should spend also a portion of their time in teaching work, including participation in formal courses to undergraduate and postgraduate students. Also, wherever practicable, active scientists in the CSIR, AEC and other research institutions outside the university system should be invited and induced to participate in teaching and research work, full-time or part-time, for short or long periods. Teaching stimulates research and creativity. It is a most fruitful and rewarding experience

16.49. **Academic Mobility.** In the field of science at the postgraduate and research levels, we attach considerable importance to mobility of students (and also teachers) between universities as well as between universities and National Laboratories and other research institutions in the country. We recommend that it should be made possible for selected postgraduate students to spend during their course work a term or two in another university or institution specializing in the subject of their interest. These students should be awarded grants to cover their expenses. Further, the UGC scheme of assisting teachers, research workers, and laboratory technicians to visit universities and research institutions for short periods (a few weeks to a few months) should be considerably expanded. The scheme is important not only for the professional advancement of the staff, but also for promoting cooperation between universities and research institutions.

16.50. **Team-work.** The development of team-work is an essential condition for the improvement of the quality of university research. It is also a necessary condition for the development of a healthy research atmosphere and research community within the departments and within the university system as a whole. Team-work must be real. It is a travesty of team-work and the spirit of research if the professor or the departmental head puts his name on every paper without his having contributed anything to the solution of the research problem. Unfortunately, this is not a rare thing in India. It should be a part of university research policy to eliminate ruthlessly such spurious and parasitic 'team-work'. Further, there should be placed a limit on the number of research students under the supervision of the head of a department or any other teacher. Research students in a department should not be all assigned necessarily to the head of the department or to professors only. Younger members of the staff, if otherwise qualified, should be encouraged and given facilities to guide and supervise research.

16.51. **Qualifications for Ph.D. Enrolments.** The qualifications for Ph.D. enrolment also need to be much more broad-based and flexible than is generally the case. It should be made possible for an M.Sc. in a particular discipline to enrol for his doctoral work in a department belonging to another discipline or faculty, subject to the approval of the head of the department concerned. This will help the development of inter-disciplinary areas. We should also encourage research-minded engineering graduates to go in directly for Ph.D. in mathematics, physics and other science subjects—in such cases a postgraduate degree should not be insisted upon as an essential requirement for proceeding to Ph.D. work. This will help in attracting more persons to engineering and technological research.

16.52. **Role of Mathematics.** As pointed out earlier, it is almost inevitable that the gap between the scientific work in a developing country and in an advanced country is large, but usually it is very much bigger in some parts of the spectrum than in others. However, if a developing country is to put forth its best effort, and to sustain it over a long period of time, it must seek some areas of scientific enterprise where it can expect to stretch itself to the utmost and do something of world significance. Identification of such areas is not easy. It demands great insight, courage and imagination, but it is essential to the whole morale of a nation's scientific endeavour. In this context a field of study which immediately comes to mind is mathematics.

16.53. We cannot over-stress the importance of mathematics in relation to science, education and research. This has always been so but at no time has the significance of mathematics been greater than today. The new revolution in science based on cybernetics and automation which is likely to be in full swing by the end of the century, may have an impact on men even greater than anything that has happened so far in human history. The cybernetic revolution would give a new importance and role to mathematics. For these and other reasons, it is important that deliberate effort is made to place India on the 'world map of mathematics' within the next two decades or so. Advanced centres of study in mathematics should be established at three or four universities in the next five to ten years. An obvious place for one such centre, we think, is the University of Madras and the Ramanujan Institute of Mathematics.

16.54. We would also recommend that at least one of the major departments of mathematics in the universities is encouraged to take an active interest in exploring the possibilities of *programmed learning* in mathematics for upgrading the knowledge and understanding of school and college teachers. In this field we could use with great profit programmed texts produced abroad, especially in the USA.

16.55. As an experimental project of great value and potentiality for the growth of mathematics in the country we suggest that one or two special secondary schools for pupils with unusual mathematical ability be set up in the near future. It would be a residential school, teaching mathematics as also other allied subjects and attached to a university with front-rank departments in mathematics and physical sciences. Here gifted young students would come in close contact with and be taught by university professors. This would give them a most stimulating and inspiring experience and promote actively the unfolding of their creative abilities.

16.56. We have suggested mathematics not only because of its intrinsic importance, but also as it is relatively easier to identify young talent in mathematics than in other fields. It is generally admitted that there is no significant correlation between creativity and high examination scores. Recently Sir John Cockcroft has thus summarised the influences which are important in the development of the creative scientists.

> A childhood environment in which knowledge and intellectual effort are so highly valued for themselves that an addiction to reading and study is firmly established at an early age.
>
> An unusual degree of independence which, amongst other things, leads to discovering early that a student can satisfy his curiosity by personal efforts.
>
> An early dependence on personal resources and on the necessity to think for himself.
>
> An intensive drive that generates concentration and persistent, time-ignoring effort in his studies and work.
>
> A secondary school training that tends to emphasize science rather than humanities.
>
> High, but not necessarily remarkably high, intelligence.[1]

16.57. **Computer Technology.** A special effort should be made by the UGC to provide computation installations and training in programming on a selective basis in the universities. By the end of the fourth plan a good proportion of the universities should have basic computer facilities to serve the requirements of study and research in science, mathematics and social sciences. Whereas general purpose computers should be widely available, sophisticated machines should be used on an inter-institutional collaboration basis. We suggest that the UGC appoint an expert committee to work out a ten-year programme for the supply of computers to universities. The possibility of setting up an advanced centre in this field for the study of computation theory, mathematical logic and numerical analysis may be examined by the UGC.

Incidentally, it may be mentioned that the USA in 1964 had about 15,000 electronic computers (equivalent IBM 7,090), and the number is increasing at the rate of 25 per cent per year. Some 1,500 of these cost more than $ 750,000 each. The UK in 1964 had some 1,000 computers. As for India, the number is less than fifty.

16.58. The recent advances in electronics, as also developments in the fundamental theory and design of computers, have given a new impetus to the study of the mechanism of the brain and allied problems. It would be desirable to support energetically and develop one or two active centres for the study of brain and psycho-somatic phenomena, using modern techniques and also drawing upon past Indian experience in this field which even today in some ways is of great significance.

16.59. **Equipment.** Scientific research is becoming increasingly complex, expensive and sophisticated, and it makes increasingly new demands on specialized, elaborate and costly equipment and instruments. As an illustration, let us take the case of chemical research. In our country, there are hardly any university laboratories of chemistry which are equipped with mass-spectrographs, digital computers, nuclear magnetic resonance apparatus (NMR), and so on; yet in advanced countries these types of instruments are in common use in chemical research. A recent report (*Chemistry: Opportunities and Needs*, 1965) of the US National Academy of Sciences provides a comprehensive survey of the state of chemistry in the USA. The report indicates that whereas the use of NMR appeared in less than one per cent of the articles published in the US Chemical Journals in 1958, the figure in 1964 was 18 per cent. The digital computers are now used in about 16 per cent of all articles. So rapid is the rate of development of science and the consequential obsolescence of research equipment and instruments, that no country can really afford to base its research on any large-scale import of foreign equipment and hardware. The level of scientific research in a country is inevitably tied up with the level of its technology and industry.

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[1] *The School Science Review*, 1966, p. 291.

16.60. A factor of vital importance for an effective science programme at the university level is timely and adequate provision of equipment needed for teaching and research. Every effort should be made to fabricate equipment locally and only such items should be imported as are beyond our resources and ingenuity to produce indigenously. Active measures will have to be taken to ensure efficient utilization of existing equipment. The UGC should devise some suitable machinery so that research equipment not in use in one university may be transferred to another where it could be put to good use. Also, facilities for fabrication and repair of scientific equipment need to be considerably strengthened. We have already stressed the extreme importance of providing well-equipped workshops in universities and colleges. The UGC and the CSIR should actively encourage and support some of the universities and national laboratories to organize instrument calibration and repair services for general use of the universities. Training of laboratory technicians should receive high priority.

16.61. It is necessary to highlight the importance of study and research in the field of laboratory design. It is not possible for individual institutions to undertake this work on any serious scale, but they all need it and will benefit from it. The problem of laboratory design, and of libraries and educational buildings generally is urgent and important, and it will assume even greater significance in the future in view of large-scale expansion and plans for improvement of educational facilities. We strongly recommend that a special unit for this purpose be set up in the UGC or the Ministry of Education. Its function will be to organize surveys and studies as may be necessary, to render technical advice to the universities and other institutions and to act as a clearing house of information generally.

16.62. **Administration of Science Departments.** Wherever we have visited the science departments of universities we have been seriously concerned about the heavy administrative load carried by the heads of departments. The work of routine administration and procurement of laboratory equipment is often done at too heavy a cost to academic duties; and it is rather distressing to find that a good deal of time of first-rate scientists is wasted on such unproductive work. The administration of science departments needs to be radically reorganized, and without delay. The departments should not be loaded with administrative work except what is directly related to their functioning and is inescapable. The heads of departments should have full authority with regard to procurement of scientific equipment and apparatus within their annual budget allocations. Adequate assistance for proper maintenance of accounts and general administration should be provided. The system of internal audit which has been introduced in some universities is certainly desirable in dealing with building construction and general stores, but it has hardly any utility in relation to the work of teaching departments. On the other hand it often leads to needless delay and irritation.

16.63. We consider the question of administration of science departments of such importance and urgency that we are inclined to quote at some length from a note given to the Commission by one of our most distinguished scientists:

> One of the greatest hurdles in achieving an uninterrupted flow of scientific work is the present procedure of obtaining sanctions through a chain of officials which include the Superintendent of the Accounts Office, the Assistant Registrar, the Finance Officer and still higher authorities. Similarly, a research worker, who requires a plug point to be repaired, often waits for months helplessly chasing papers from one official to another and making telephone calls to various persons from the engineer downward... It is a pity that the universities follow a penny-wise and pound-foolish policy in attaching so little value to the time of their top scientists.... Presently the head of a large science department is largely a glorified clerk, an accountant and a filler of forms. He is appointed to do teaching and research work but the general set-up around him is such as to lay a dead hand on both teaching and research. Those, who still manage to do something, do it at the expense of their personal affairs and neglect of their families.

16.64. If a science department is to make full use of its resources, it is necessary to associate the staff with the administration and decision-making in the department. We have recommended elsewhere the establishment of departmental committees which should function in science departments also The committee should normally meet at least three or four times a year if not once every month. It should deal with the distribution of available funds between teaching and research, choice of special equipment, admission of students specially at the postgraduate and research levels, and should also be consulted informally regarding selection of academic staff. It would be desirable to establish the committees by university ordinance or regulation. Its proceedings should be submitted to the vice-chancellor for his information and the Executive Council. The university regulations should also provide for the delegation by the head (with the approval of the vice-chancellor) of such of his powers and responsibilities as may be necessary from time to time.

16.65. **Pure and Applied Research.** We should now turn to the subject of pure and applied research. It is often stated that universities should perform almost exclusively pure (basic) research, leaving applied research and development in all branches of science to other institutions. This belief is based on an image of university role and of research which prevailed among a minority of university teachers in the scientific world some decades ago. The universities, in the industrialized countries, as shown by the distribution of the national research potential and programme, make a substantial contribution to applied research, and some of them to a small degree even in development research. Today with the advance of science and technology the distinction between pure and applied research—between a research scientist and a research engineer —has become artificial and in several fields (*e.g.*, electronics) it has almost disappeared. The same individual may be working at one time on pure research and at another time on an applied problem. The difference between pure and applied work is one of motivation and goals, and not of techniques and creativity. In pure research, one is concerned primarily with gaining a new insight or discovery of new knowledge, whereas in applied work the objective is to meet some felt needs in industrial development or production: applied research usually carries a time schedule limit for its completion. We strongly recommend that applied work such as developing important new techniques (new for the country) or designing and fabricating special instruments or apparatus should receive proper recognition, and it should be made possible for such work to earn Ph.D. awards. Also it should be mentioned that whereas in the case of pure science a research contribution must bear international comparison to be of any value, the same is not equally valid in the field of applied science. In the case of pure research, the value of a contribution in a particular field lies in the stimulus it provides to research in that field, but in the case of applied research, the value of a contribution lies in the stimulus it gives to local development of instrumentation, processes and techniques.

16.67. In this context it may be observed that pure science enjoys almost everywhere much greater prestige than applied research; and if anything this is more accentuated in countries where science is comparatively a new thing. Unless special care is taken, pure research will tend to dominate, and drive out applied work. It seems that, left to itself, there is nearly always a tendency for research (even in project-oriented laboratories) to become 'purer and purer' unless there are strong counter-acting forces. This needs to be kept in view in the organization of research in technological institutions. These should place special emphasis on applied and industrial research.

16.68. In his discussions with us, professor) P. M. S. Blackett particularly stressed the importance of applied research for a developing country like India. This necessarily implies close and intimate co-operation between research in the universities and engineering institutions, usefully employing not only engineers but pure science investigators. The problems of industrial research need to be jointly tackled on a co-operative basis by staff in the universities and engineering institutions as well as those working in industry. There could and should be a movement of staff from universities to industry and vice-versa. Consultancy and advisory positions and even directorships in industrial concerns can be offered to academic people. In West Germany industry has put up research institutions in collaboration with some of the university departments, and they work together closely on many projects. This is worthwhile implementing in India wherever conditions and facilities are favourable.

16.69. In the USSR, educational institutions work in close and active touch with industry. A considerable amount of basic and applied research for industry is carried out in educational institutions (universities and engineering institutes), and is paid for by industry. In certain specialized fields high grade industrial engineers and scientists work on part-time basis as professors in educational institutions. Also, it is quite common for postgraduate students to do a part of their research in industrial establishments using industrial plant and facilities.

16.70. Academician P. Kapitza has in a recent article stressed the following conditions as essential for application of technical and scientific discoveries to industry:

> Favourable moral and material conditions must be provided for industry to learn and adopt new technology. Adopting a new technology means doing something that industry had not done before. The introduction of new technology is, therefore, in the nature of a learning process for the industry.
>
> There must be adequate preliminary training in the industry concerned before attempting to introduce new technology into it.
>
> Industry must not be overburdened with too many tasks and assignments.
>
> Effective learning of new technology by industry is possible only in favourable material circumstances.
>
> It is essential to have carefully worked out programmes setting forth the procedures to be followed in carrying out application of new technology to industry.
>
> 'Moral conditions' for the co-operation of scientists with industry must be very favourable.[1]

A survey has not yet been made showing how in India the university research potential is distributed along basic, mission-oriented basic, applied, and development research. It is essential that this survey be made as soon as possible. One beginning in this direction should be made by analysing the surveys made in various branches of research in Indian universities and by analysing the subject of Ph. D. theses from this point of view.

16.71. **Expenditure on University Research.** We shall now turn to expenditure on university research in India. The total expenditure on research and development for the year 1963-64, the latest year for which data is available, may be taken to be about Rs. 600 million, that is, about 0.3 per cent of the GNP. The figure involves a considerable margin of uncertainty, and in part it arises from an element of ambiguity in the definition of research and development. The expenditure incurred by the Central Government is given in Table 16.8; that by the State Governments is shown in Table 16.9.

TABLE 16·8. CENTRAL GOVERNMENT EXPENDITURE ON DIFFERENT SECTORS OF SCIENTIFIC RESEARCH (1963-64)

Sl. No.	Sector	Rs. (in millions)	Percentage
1		3	4
1.	Agriculture and Forestry	47·01	9·35
2.	Animal Husbandry, Fisheries and Dairy Research	17·95	3·57
3.	Scientific, Industrial and Technological Research	128·21	25·49
4.	Medical Public Health and Forensic Sciences	26·71	5·31
5.	Irrigation and Power	18·46	3·67
6.	Geological Survey	37·81	7·52
7.	Atomic Energy	127·54	25·37
8.	Economics and Statistics	21·43	4·26
9.	Archaeological Explorations and Anthropological Survey	1·96	0·39
10.	Railways	8·13	1·62
11.	Defence	67·60	13·44
	TOTAL	502·81	100·00

Source. *Science in India*, CSIR, New Delhi, 1966.

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[1] English translation of Professor P.L. Kapitza's article published in *KOMSOMOLSKAJA PRAVADA* of 20 January 1966.

TABLE 16·9. EXPENDITURE ON RESEARCH AND DEVELOPMENT INCURRED BY THE STATE GOVERNMENTS IN 1963-64

	Rs. (in millions)
1. Agriculture and Forestry	29·87
2. Animal Husbandry, Fisheries and Dairy Research	5·78
3. Scientific, Industrial and Technological Research	1·32
4. Medical and Public Health	12·09
5. Irrigation and Power	2·08
6. Geological Survey	3·20
TOTAL	54·34

Source. Same as for Table 16 8

16.73. The expenditure on university research is obviously hard to estimate, because, apart from other things, there is an inherent difficulty in separating expenditure on research from that on training. As a reasonable estimate, we should take the figure to be Rs. 200 million and it is likely to be less. All the same, the figures demonstrate strikingly the fundamental weakness of the present structure of research expenditure in the country. *University research receives far too small an allocation and if this is not radically corrected, the future of the entire research effort in the country will be in jeopardy.* A comparison with a country such as the USA or the USSR is, perhaps hardly meaningful because the scale of effort is of an altogether different order of magnitude. Still it is interesting to note that industrialized countries spend about 10 per cent of the total research and development effort on university research. If we exclude defence expenditure, the proportion would be about 20 per cent. The Indian figure is very much less, but even this is not the most significant aspect of the situation. *The more important thing is that in all educationally advanced countries the expenditure on university research constitutes about half of the total expenditure on higher education.* Also about one-half of the time, on an average, of university teachers is devoted to research. It is this balance between teaching and research which lends to the universities their peculiar strength and vitality. The percentage of total university expenditure devoted to research in our country is almost negligible. It is this imbalance which we must seek to redress as quickly as possible not only in the interest of university science but as crucial to the progress and vitality of science in the country. We are definitely of the view that by the end of the decade, something like a quarter of the total university expenditure should be devoted to research.

16.74. It would be desirable that in the early stages, the UGC makes separate allocations to the universities for support of research. A related matter of great importance is the provision of foreign exchange. The centres of advanced study and major universities described elsewhere in the report would need an outlay of at least 50 million dollars in foreign exchange spread over the next 10 years. A similar amount would be required for other institutions of science and engineering in the country. This would give a figure of a 100 million dollars over 10 years, *i.e.*, $ 10 million per year. In terms of rupees this would amount to Rs. 7.5 crores per year. There is a serious shortage of basic literature in science and technology in our libraries. The supply of journals is inadequate and there is a large demand for back volumes of important periodicals. The expenditure on books and journals alone would account for over a crore of rupees a year.

BASIC RESEARCH OUTSIDE THE UNIVERSITIES

16.75. We would like to draw special attention to one major problem in the field of basic research. At present there are a number of institutions in the country which devote almost their entire effort on university type of research but function outside the university system. These institutions almost invariably (because of personal initiative and other factors) succeed in securing better salaries for their scientists, expensive equipment and generally even more expensive buildings. Be that as it may, at the present level of our resources it will be most unfortunate and short-sighted, almost suicidal, to organize fundamental research divorced from teaching. The real strength of the universities lies in that they combine teaching and research, but this they can do effectively only if adequate facilities for research are made available to them. The time has now come when a serious effort should be made to bring within the universities, or at any rate to link intimately with them, institutions devoted to fundamental research but functioning outside the university system.[1] This is necessary as much in the interest of growth of science in the country as that of the institutions themselves. Institutions engaged in fundamental research and isolated from universities lack the critical and continuing challenge of fresh and youthful minds and cannot last for more than a generation even under favourable conditions. As a matter of national science policy, unless there be very exceptional reasons, the setting up of special facilities and institutions for basic research separate from teaching should be avoided.

16.76. Also, due to the opening of too many research laboratories, the universities have been denuded of their senior teaching and research personnel. As Dr. H. J. Bhabha pointed out in his address to the meeting of the International Council of Scientific Union, a few weeks before his tragic death. '.... the attempt to fill senior posts by mature scientists from outside must inevitably lead to their being taken away from the only institutions which have scientists in some measure, however inadequate, in an underdeveloped country, namely, the universities. It cannot be disputed that the cost of building the national laboratories on the lines followed by the Council of Scientific and Industrial Research has been the weakening of the universities by the drawing away of some of their good people, which is their most valuable asset'.

BRAIN DRAIN

16.77. We would like to make a brief reference to the problem of 'brain drain'. It is most desirable for the health and progress of science in our country that a small proportion of *young talent* gets an opportunity for advanced study and research at world-famous centres abroad. The training and research fellowships, including teaching assistantships offered by several countries—by governments, universities, industries, private institutions and foundations—are to be welcomed. A large proportion of research students (some before and others after completing their Ph.D. work) from some of our leading departments of physics and mathematics go abroad every year; and the same applies to postgraduates in engineering and technology from the IITs. Some of our outstanding people are also invited as visiting professors and several are offered appointments for indefinite periods in educational institutions and industry abroad. All this has a side-effect which cannot be ignored. A considerable proportion—we have no precise estimates—of those who go abroad tend to stay indefinitely and a sizeable number accept foreign nationality. The migration is largely to the USA. The number of Indian scientists abroad who registered themselves with the CSIR during the last five years was about 6,900 whereas those who returned during the same period was about 2,800.

16.78. Those who go abroad generally obtain far better emoluments than available in the country, and in general also better research facilities. However, not all who go out of India are necessarily first-rate scientists, nor are they of critical importance to the country's requirements. We recognize that the seriousness of the 'brain-drain' is often exaggerated, but even so the problem is of sufficient importance to merit a close and systematic study. Talent attracts talent, and even within a country this often leads to dangerous anomalies in the geographical distribution of outstanding scientists and engineers. This is becoming quite a serious problem even in the USA.

16.79. A person with dominating research interests has a dual loyalty, as it were, to his subject and to his community. The first pulls him towards the place where he gets the best 'climate' and opportunities for work, and the second pulls him towards his homeland to share and to improve the lot of those amongst whom he was born and nurtured. The weightage that an individual gives to these at times conflicting forces depends largely on his temperament, his sense of values and social responsibility. Education has an important role to play here. It should promote the sense of commitment to one's people and social responsibility towards them, but in no narrow or chauvinistic sense. It should inculcate a deep sense of duty towards the community in which one had the privilege of being born and brought up. One should regard it as a part of good fortune if through knowledge one could help one's fellowmen in the pursuit of happiness and a worthwhile life.

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[1] Examples of such institutions are : Bose Research Institute (Calcutta) ; Laboratories of the Indian Association for the Cultivation of Science (Calcutta) ; Tata Institute of Fundamental Research (Bombay) ; Physical Research Laboratory (Ahmedabad), Birbal Sahni Institute (Lucknow); Mathematical Research Institute (Madras); Raman Institute (Bangalore).

16.80. It may be pointed out that in recent years the migration of scientists and engineers between different countries is nearly all one-way—it is a flow into the USA. Between 1952-1963 this influx amounted to more than 4 per cent of the yearly output of US graduates in science and engineering. It reached a peak of 8 per cent in 1957. Table 16.10 gives interesting information about migration of scientists and engineers to the USA.

TABLE 16·10. MIGRATION OF SCIENTISTS AND ENGINEERS TO THE USA

Country of last permanent residence	Immigrants into the USA (Annual average 1956-61)			Immigrants as a percentage of 1959 output of science and engineering graduates		
	Scientists	Engineers	Scientists and Engineers	Scientists	Engineers	Scientists and Engineers
France	26	56	82	0·5	1·2	0·9
FR Germany	124	301	425	6·0	9·8	8·2
Netherlands	34	102	136	7·9	21·8	15·1
United Kingdom	155	507	662	2·6	17·2	7·4
TOTAL WESTERN EUROPE	339	966	1,305	2·5	8·7	5·4
Austria	23	43	66	..	10·9	7·0(1)
Greece	14	50	64	3·6	20·7	10·2
Ireland	13	32	45	4·7	15·4	9·3
Italy	29	42	71	0·9	1·7	1·3
Norway	6	72	78	3·4	23·8	16·2
Sweden	8	97	105	1·3	16·3	8·8
Switzerland	38	96	134	10·6	22·4	17·0
ALL EUROPE (including others)	549	1,684	2,233	..	..	..
Canada	212	1,027	1,239	12·5	48·0	32·3
ALL COUNTRIES	1,114	3,755	4,869	..	..	..

(1) Estimated.

Source. *Scientific Manpower from Abroad*, NSF 62-24, Washington, and *Resources of Scientific and Technical Personnel in the OECD Area*, OECD 3rd International Survey, Paris, 1963.

16.81. The total number of foreign citizens in the US colleges and universities was 91,000 in the academic year 1964-65. Of this 82,000 were students (46% were undergraduates) and 9,000 were teachers or persons holding research appointments. Canada provided the largest number of foreign students (9,253) and India came second with 6,813 students. The UK provided the largest number of faculty members and research appointments (1,166), Japan stood second. and India third (1,002). The distribution of Indian students according to field of major interest was: agriculture 322, business administration 342, education 225, engineering 2,880, humanities 455, medical sciences 285, physical and cultural sciences 1,561, social sciences 690. The number of American citizens abroad in 1964-65 was 22,000. Of this 18,000 were students (about 11,000 to Europe) and 4,000 faculty and administrative staff members.[1]

16.82. The UK Royal Society Committee which examined this question sometime ago reported that 'the emigration of scientists has created some serious gaps in the scientific effort.' Incidentally, we may point out that Japan has hardly any 'brain-drain' problem: the Japanese scientists go abroad in large numbers, but they go on deputation and almost always return to their country.

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[1] Data taken from *Open Doors*, 1965, Institute of International Education, New York.

FELLOWSHIPS FOR OVERSEAS TRAINING

16.83. Apart from fellowships awarded by foreign agencies, there is a real need for institution by the government of a limited number of research fellowships, say about 100, to be awarded every year for study and research abroad. These fellowships should be awarded to persons of outstanding ability, selected on an all-India basis and in subjects related to our teaching and research needs. The awardees should hold teaching or research appointments (or be pre-selected for such appointments) and there should be some form of 'bonding' for them to return to their institutions. Also no less important is the training of technicians for specialized work. We should avail of the research and training facilities in countries like Japan, Sweden, France, Germany, besides the USA, the UK, and the USSR for the purpose.

NATIONAL SCIENCE POLICY

16.84. Science policy and decisions concerning science now play such a vital role in the national economy and defence that it is most important for the governmental authorities at the highest level to ensure that on major scientific issues they can get advice which is as impartial and objective as it possibly can be. It is important to have an advisory body which is appropriate for this purpose. Such a body should have on it, besides heads of major agencies concerned with scientific research, persons who have a high standing and regard in their professions and who inspire general confidence—a proportion of these members should be distinguished young scientists in their thirties. The number of such persons should not be less than the agency heads. They could be from the universities, research institutions (government or non-government), industry and public life. The advisory body should also have on it not only scientists and technologists but also economists and social scientists and persons with experience of industry and management.

16.85. A fundamental concern of science research policy is the relative allocation of priorities with reference to different sectors of scientific effort, both in terms of subjects and in terms of operating agencies. This is a problem which involves vital scientific issues, but it goes beyond science. It involves important economic and political considerations. The resources in men and material available at any time for R and D are severely limited. This is so even for affluent countries. The number of able scientists and engineers is often the critical factor in determining the total volume of the R and D effort. Difficult and sometimes unpleasant choices have to be made among the many competing claims on the use of the available talent and professional manpower. This is inevitable, and a responsibility which cannot be shirked. To lay down effective and operational priorities is not at all an easy thing. It needs a relatively well-defined formation of the national goals and objectives, and it needs hard, courageous and imaginative thinking.

16.86. The present Scientific Advisory Committee to the Cabinet cannot perhaps be considered to have effectively performed the functions envisaged above, no matter what its terms of reference are. The Committee is mainly constituted of representatives of the important research organizations in the country. This makes, to say the least, an objective and critical examination of issues of national research policy difficult. The members are often too directly involved to be able to take an objective and detached view. In most of the advanced countries the top Advisory Committee is composed of people who have no 'vested interests' in an institution to defend or to fight for.

16.87. We recommend that the Scientific Advisory Committee be reorganized and provided with an effective secretariat with a professional component adequate to its tasks. The Committee should be in a position to assess the broad scientific needs of the country including the universities and advise government on science policy and allocation of total resources between different sectors of scientific activities. The task of this body should be to review continuously the national research policy situation.

16.88. Recently the Atomic Energy Department has undertaken a programme for research in radio astronomy and also in the field of molecular biology. The interest of the AEC in these fields is to be welcomed. But it needs to be stressed that these fields of research should primarily be developed and supported in the universities unless there be compelling reasons to the contrary (we are not aware of such reasons).

16.89. We should like at this stage to say a word about the Research Councils. We have the Council of Scientific and Industrial Research, the Indian Council of Agricultural Research, the Medical Research Council and the Defence Research Council. It is our view that bodies concerned with science policy and implementation and which have executive and managerial functions requiring detailed and expert examination of diverse issues should ordinarily have professional scientists, engineers or science administrators of high standing as their chairmen.

16.90. We may mention that in most of the scientifically advanced countries the organization at the national and governmental levels of research has undergone drastic changes during the last five years or so. In the UK, following the Trend Committee Report, the Department of Scientific and Industrial Research (which corresponds to the CSIR) has been completely overhauled. In its place there has been constituted the Science Research Council which deals with those functions of the DSIR which were concerned with basic research, fellowship awards and research grants to universities. Several of the DSIR laboratories, including the National Physical Laboratory have been transferred to the new Ministry of Technology with a view to bring the laboratories into closer relationship with industry. The AEC is with the Ministry of Technology. There is also an Advisory Council on Science Policy.

16.91. It should be a major task of the national research policy, and policies of the universities to provide a 'climate' conducive to research, and to prevent and eliminate, through energetic and public measures, all dangers and infringements of autonomy and freedom of action in research. It should be recognized that all this needs deliberate effort, and it also takes time. To quote Michael Polyani: 'Those who have visited the parts of the world where scientific life is just beginning, know the back-breaking struggle that the lack of scientific tradition imposes on the pioneers. Here research work stagnates for lack of stimulus, there it runs wild in the absence of any proper directive influence. Unsound reputation grows like mushrooms, based on nothing but common place achievements, or even more on empty boasts....However rich the fund of local genius may be, such environments will fail to bring it to fruition.'

16.92. In the case of scientific work, zest and enthusiasm of high quality are extremely important. This needs freedom from petty worries and distractions, a proper research climate and a good morale among scientists. It is no easy thing to build scientific institutions with international reputation. These demand single-minded effort, devotion and dedication.

16.93. In determining our priorities for research we should be guided by our own national needs and not be unduly influenced by what may happen to be the current fashion in science. If space research and nuclear physics are given a high place in a nation's programme of research, it will be futile to expect that the young talent will elect agriculture or industrial research. If marble floors and possession of expensive equipment become the outer symbols of scientific status, a waste of national resources in the name of science and research becomes almost inevitable. Fred Hoyle has observed: 'People who work in marvellous buildings are dominated by those buildings, whereas it is the other way round for people who work in rabbit warrens. The builders of the great European cathedrals knew this perfectly well. Walk into a big cathedral and it wipes your brain clean of all thoughts. The same thing happens when you walk into these wonderful modern office blocks. The same thing happens all too easily in big science.'[1]

SCIENCE ACADEMY

16.94. In the scientific life of a country a national organization or academy of sciences occupies an exceedingly important place. In some ways its role is crucial for the growth of science education and research. While this is not the place to go into the subject at any length, we feel that a brief reference is necessary.

16.95. In India the role of a National Academy is performed partly by the National Institute of Sciences. However, it may need some drastic reorganization, if the Institute is to exercise a vigorous leadership in science and play a more significant role in the scientific activities of the nation. In recent decades the demarcation between science and technology has become increasingly thin and artificial, and for this and other reasons, it may be desirable to widen the scope of the fellowship and bring into the Institute more engineers and technologists. Further, if the Institute is to be seriously concerned with the inter-action between science, economic growth and national development, it would be useful to extend the fellowship to economists and social scientists. This is the practice in several academies, the most important being the Soviet Academy of Science.

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[1] Fred Hoyle, *Of Men and Galaxies*. University of Washington Press, 1964.

16.96. In the above context, we may refer also to the Science Council of Japan established after World War II, as it has some features which could perhaps be usefully incorporated in our own organizations. The Council is the legal and official representative body of the scientists of Japan. The JSC has no direct control over research. Its function is to determine what is best for science in Japan and to advise government accordingly. It is under the jurisdiction of the Prime Minister. It has seven divisions: (1) literature, philosophy, pedagogy, psychology and sociology, history; (2) law, political science; (3) economics, commerce and business administration; (4) pure science; (5) engineering; (6) agriculture; (7) medicine, dentistry, pharmacology. The 210 members of the Council, 30 from each of the seven divisions, hold office for three years. They are elected by a nationwide constituency of electors who are either graduates of at least two years standing or possess five or more years of actual research experience. The Council has a Management Committee of 31 members. The constitution of the Japanese Council is highly democratic. In these days when science impinges on broad issues of economic and national policies, it is desirable that a national organization of scientists is not controlled entirely by the scientific aristocracy, as it were, but the entire scientific community gets a chance to participate in the life and work of the organization.

16.97. Many of the major issues of science policy involve considerations which go outside the strict domain of science. In view of this, and other reasons, it is an advantage for a national organization which claims to speak on behalf of the scientific community to involve in its deliberations some elected representatives of the entire fraternity of science. For a country of the size of India it may not be possible to adopt the pattern of the Science Council of Japan, but the possibility could be explored of associating with the National Institute of Sciences a small number of scientists (not fellows of the Institute) elected by the scientific community. The number of such members could be limited to about a third of the total strength of the Council. Such an arrangement would help the process of activization of science by bringing closer contact and participation between its different components.

16.98. A national academy has also a major function in promoting international relations in science. Such a body represents the country on international scientific organizations such as the International Council of Scientific Unions and its various committees. India is almost the solitary case of a country which is not represented on the ICSU by a professional academy but by the Government. It is worth mentioning that science academies often help in furthering cooperation between countries amongst which political relations may not be normal.[1]

CONCLUSION

16.99. The broad conclusions are simple and apparent. But often it is the obvious things which are the hardest to implement:

—Strengthening of university science and research should be conceived as a fundamental goal of national science policy.

—In the universities, good work, good teaching and good research should be energetically and generously supported at all levels. In science the output in terms of achievement is directly proportional to the input in terms of hard and honest work. Work of poor quality and pseudo-research should be ruthlessly discouraged.

—Contacts between the universities and national laboratories, scientific government departments, and industry should be vigorously promoted and strengthened. Any one who has a real competency and willingness to participate in university work should be encouraged to do so. So great and urgent is our need that all resources need to be fully exploited.

—'Right climate', leadership and dedication are important factors in promoting team-work and in generating scientific work of high quality. Able and gifted men should be given every opportunity for concentrated and sustained work free from petty worries and distractions. Informal and enlightened public support of science (but not lip service or uncritical adoration) is an essential factor in creating a proper climate for scientific work. Science should not only be held in high regard but it should also enjoy the confidence of the public. The universities have an obligation and a role in promoting public awareness and understanding of the organization and achievement of science in the country, its strengths and weaknesses.

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[1] For instance, the USA Academy of Sciences has shown much initiative in exploring the possibilities of scientific cooperation with the Peoples' Republic of China. (*Science*, June 17, 1966).

- In science departments, the administrative load and 'routine' should be cut down to a minimum.

- Teaching and research are mutually supporting activities. There is no real border line between them—they merge into each other. In their symbiotic combination lies the unique and peculiar strength of the universities.

- Our resources are limited, so one has to spend more thought to get more out of our resources—spending thought is more difficult than spending money.

16.100. Science education and research are crucial to the entire developmental process of the country. The experience of several countries, notably the USSR and Japan has shown that it is only on the basis of purposeful science education and research that a stagnant economy can be radically transformed into an industrial economy in a comparatively short time. The highest priority therefore has to be given to the improvement in the quality, as also a balanced expansion, of science education and research. The responsibility for this rests primarily with the Central Government and the scientific agencies closely associated with it. They alone can provide the necessary leadership and resources.

16.101. We cannot conclude this chapter better than by recalling the memorable words of Jawaharlal Nehru:

> Science has developed at an ever-increasing pace since the beginning of the century, so that the gap between the advanced and backward countries has widened more and more. It is only by adopting the most vigorous measures and by putting forward our utmost effort into the development of science that we can bridge the gap. It is an inherent obligation of a great country like India, with its traditions of scholarship and original thinking and its great cultural heritage, to participate fully in the march of science, which is probably mankind's greatest enterprise today.[1]

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[1] Statement in Parliament on the Science Policy Resolution.

CHAPTER XVII

ADULT EDUCATION

I. *The Scope of Adult Education.* (1—6).

II. *Liquidation of Illiteracy.* (7) The need for action; (14) The targets; (14) The concept of literacy; (15) Programmes for arresting the growth of illiteracy, (17) The strategy; (19) The selective approach; (21) The mass approach; (25) The new function of the school; (26) Conditions necessary for the success of literacy programmes; (27) Literacy for women; (29) Role of radio, television and audio-visual aids; (30) The follow-up.

III. *Continuing Education.* (32) Significance; (34) General recommendations; (37) Education of industrial workers; (42) Special programmes and institutions.

IV. *Correspondence Courses.* (44—56)

V. *Libraries.* (56—60)

VI. *The Role of Universities in Adult Education.* (61) Significance; (63) Programmes; (65) Administration and finance.

VII. *Organization and Administration.* (68) National Board of Adult Education; (69) Adult education—a total Government function; (70) Voluntary agencies.

THE SCOPE OF ADULT EDUCATION

17.1. Education does not end with schooling but it is a life-long process. The adult today has need of an understanding of the rapidly changing world and the growing complexities of society. Even those who have had the most sophisticated education must continue to learn; the alternative is obsolescence.

17.2. One of the major planks in the strategy of a society which is determined to achieve economic development, social transformation and effective social security should be to educate its citizens to participate in its developmental programmes willingly, intelligently and efficiently. This is particularly urgent in a society in which masses of people have missed schooling and in which the education given has been irrelevant to the developmental needs. The farmer who tills the soil or the worker who turns the machine must understand the nature of the soil and the machine and acquire some acquaintance with the scientific processes involved in production in order to be able to adopt new practices and improve upon them. Mere persuasion or coercion cannot arrest population growth; people must understand the implications of unchecked increase in population, acquire some knowledge of the laws of life and appreciate individual responsibility in programmes of family planning. No nation can leave its security only to the police and the army; to a large extent national security depends upon the education of citizens, their knowledge of affairs, their character and sense of discipline and their ability to participate effectively in security measures.

17.3. Thus viewed, the function of adult education in a democracy is to provide every adult citizen with an opportunity for education of the type which he wishes and which he should have for his personal enrichment, professional advancement and effective participation in social and political life.

17.4. In normal conditions, programmes of adult education presume universal literacy. In the Indian context 70 per cent of the people are unable to read and write and, naturally, liquidation of illiteracy becomes a matter of immediate national concern.

17.5. The scope of adult education is wide: as wide as life itself. Its requirements are somewhat different from those of the normal school system. It depends upon the support it receives from several agencies, particularly the universities and public institutions and libraries. The effectiveness of the programmes of adult education depends upon a competent administrative machinery.

17.6. An effective programme of adult education in the Indian context should envisage the following:

- — liquidation of illiteracy;
- — continuing education;
- — correspondence courses;
- — libraries;
- — role of universities in adult education; and
- — organization and administration of adult education.

We shall discuss these in the present chapter.

LIQUIDATION OF ILLITERACY

17.7. **The Need for Action.** India was more illiterate in 1961 than in 1951, with an addition of about 36 million illiterates. In 1966, it has 20 million more illiterates than in 1961. This has happened despite unprecedented expansion of primary education and despite many literacy drives and programmes. Though the percentage of literacy has risen from 16·6 per cent in 1951 to 24 per cent in 1961 and 28·6 per cent in 1966, a faster growth of population has pushed the country further behind in its attempts to reach universal literacy. The moral is obvious: conventional methods of hastening literacy are of poor avail. If the trend is to be reversed, a massive unorthodox national effort is necessary.

17.8. The price which the individual as well as the nation pays for illiteracy is high, although one grows accustomed to the persisting malady and becomes insensitive to the harm it does. The circumstances of modern life condemn the illiterate to live an inferior existence. He has little prospect of a reasonable income. He remains isolated from sophisticated social processes, such as democratic government and commercial marketing. The uneducated is not in reality a free citizen. Illiteracy as a mass phenomenon blocks economic and social progress, affects economic productivity, population control, national integration and security and improvement in health and sanitation. In the words of Prof. V. K. R. V. Rao, Member, Planning Commission, 'Without adult education and adult literacy, it is not possible to have that range and speed of economic and social development which we require, nor is it possible to have that content, or quality or tone to our economic and social development that makes it worthwhile in terms of values and welfare. A programme of adult education and adult literacy should therefore take a front place in any programme for economic and social development'.[1]

17.9. There can be little disagreement with the above general statements which, in one way or another, were recognized even before independence. But the principal strategy adopted so far to make the people literate has been to place an exclusive emphasis on the development of a programme of free and compulsory education for all children till they reach the age of 14 years. If this could have been effectively implemented by 1960, as once visualized, the problem would have been considerably simplified. However, for reasons which have been examined elsewhere, it has not yet been possible to implement the programme and we can at best hope to provide five years of effective education to every child by 1976 and of seven years by 1986. Moreover, the system of primary education continues to be largely ineffective and wasteful and many children who pass through it either do not attain functional literacy or lapse into illiteracy soon afterwards. If we are to continue our dependence on this programme alone for the liquidation of illiteracy, we may not reach our goal even by 2000 A.D.! It is, therefore, evident that, while our efforts to develop a programme of free and compulsory education should continue with redoubled vigour, a time has come when a massive and direct attack on mass illiteracy is necessary.

17.10. This is not to say that no direct attack on mass illiteracy has been launched so far. In fact, the history of adult education during the last thirty years shows that many literacy drives have been organized on a State or a local basis, which were launched with considerable drive and enthusiasm but which petered out in apathy and dissipated efforts a few years later. There are several reasons for this. The campaigns were too limited in scale to achieve a significant advance and generate enthusiasm for further effort. They also tended to be sporadic and uncoordinated—government departments, voluntary agencies, educational institutions and individuals working more in isolation than in active collaboration with other agencies. They were often launched hastily, without the careful assessment of the needs and interests of adults, without awakening public interest or stimulating the desire to learn and without adequate provision for the follow-up work in the absence of which no lasting results could be obtained. It is, therefore, not surprising that they failed.

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[1] Dr. V.K.R.V. Rao, *Education and Human Resource Development*, Allied Publishers, New Delhi, 1966.

17.11. Sustained support and purposeful orientation of literacy programmes depend upon conscious acceptance of certain basic facts. For instance, it should be accepted that the pace of industrialization and modernization of agriculture and in general of the economic progress of the country is inhibited by the large number of illiterates who constitute the 'work-force'. Assuming that the age-group 15—44 constitutes the work force, it includes 144 millions of persons or 67·4 per cent of the age-group who are illiterate.[1] Further, illiterate people tend to resist change and cling to traditional forms of life, while modernization of social life demands revolutionary changes in the accepted pattern. Illiteracy among the masses is inconsistent with the spirit of the age in which scientific and technical progress determines the way of life and standards of living. New ideas and new practices cannot be effectively communicated to minds which are untrained to receive them and to make use of them. Whether it is family planning or improvement of sanitary standards or any programme of social security or any move which requires change of attitude and habits of life, it must make sense to the people. Similarly, it should be realized that uneducated people cannot make a real democracy, the essence of which lies in participation by the people in organized civic life and in important decision-making. The Universal Declaration of Human Rights, Article 26 of which states that every one has a right to education, applies equally to the adults of the future as to those of the present. The existence of the vast masses of illiterate people in our country which prides itself on its noble traditions of learning, is humiliating. These are simple and self-evident facts which are seldom disputed. It is, however, necessary to realize that an effort commensurate with the magnitude of the task of eradication of illiteracy is inconceivable unless there is a clear conviction on the part of the national leadership that the education of the masses of illiterates has a direct bearing on economic and social progress and on the quality of national life. Lack of conviction is evident from the fact that so far there has been no political commitment to any programme of adult education. This may be due to some extent to the magnitude of the problem. The numbers involved are so great, resources demanded in terms of finance and trained personnel so apparently enormous, that there is a natural tendency, particularly in the face of the competing priorities, to give up the goal as unattainable and to leave the solution to time and to the development of universal primary education. This attitude is unhelpful. We think that the problem must be faced resolutely and realistically and we are convinced that indifference to it will not remain unpunished.

17.12. To put an end to this intolerable situation, we recommend a nationwide, coherent and sustained campaign for liquidation of illiteracy. The campaign approach is necessitated by the lack of resources and realization of the urgency of the problem. The campaign should be inspired by a faith in its vital significance to national life and should be organized and supported vigorously by the social and political leadership in the country. It should involve the Central, State and Local governments, all governmental agencies, all voluntary agencies and private organizations and industries, all educational institutions ranging from the universities to primary schools and above all, all educated men and women in the country. A lesser effort will fail to generate the necessary motivation and build up effective momentum. The task is enormously difficult. It requires a spirit of dedication, imaginative organization, intelligent coöperation of all agencies involved and ungrudging effort and sacrifice on the part of the workers. However, the task can be achieved; it was achieved in the USSR immediately after the Revolution. The determined Russian effort gained for the country much more than mere universal literacy. It gave the people a sense of achievement and national pride and prepared it for participation in social transformation. The situation in India is somewhat different, but a mighty effort similar to the Russian will be an educational experience of great national significance.

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[1] See Paper on *Magnitude of Illiteracy in India* Supplementary Volume I, Part V.

17.13. **The Targets.** The essential condition for success in a literacy programme is that it should be very carefully planned and that all necessary preparations should be made well ahead in time. Organization of massive programmes, preparation of material, training of personnel and a number of other requisites require time. We do not visualize launching a nationwide programme in all parts of the country at the same time. It is, however, possible to proceed systematically from area to area in each State according to the opportunities available and gradually to cover the entire State and the country. It will be possible to achieve full literacy in different areas at different times depending upon the stage of educational development in the area, public cooperation and efficiency of organization. Time is an essential factor in combating illiteracy and a delay of more than 10 or 15 years in liquidating the problem on a massive scale will defeat its very purpose. We think that with well planned efforts it should be possible to raise the national percentage of literacy to 60 per cent by 1971 and to 80 per cent in 1976. These targets will no doubt require tremendous effort and organization; but they are not impracticable. We recommend that every possible effort should be made to eradicate illiteracy from the country as early as possible and that in no part of the country, however backward, should it take more than 20 years to do so.

17.14. **The Concept of Literacy.** We do not equate literacy with the mere ability to read and write. Literacy, if it is to be worthwhile, must be functional. It should enable the literate not only to acquire sufficient mastery over the tools of literacy but also to acquire relevant knowledge which will enable him to pursue his own interests and ends. The World Conference of Education Ministers on the Eradication of Illiteracy organized by UNESCO at Tehran (1965) concluded 'that rather than an end in itself, literacy should be regarded as a way of preparing man for a social, civic and economic role that goes far beyond the limits of rudimentary literacy training, consisting merely in the teaching of reading and writing. The process of learning to read and write should be made an opportunity for acquiring information that can immediately be used to improve living standards; reading and writing should lead not only to elementary general knowledge but to training for work, increased productivity, a greater participation in civil life, a better understanding of the surrounding world and should, ultimately, open the way to basic human culture'. We agree with the view taken by the Conference. Literacy programmes should inspire and enable the adult to use his knowledge of literacy for his own further education and encourage him to profit by the scheme of continuing education which we propose to discuss subsequently. Thus viewed, literacy programmes should have three essential ingredients.

(1) It must be, as far as possible, 'work-based' and aimed at creating attitudes and interests and imparting skills and information which will help a person to do efficiently whatever work he is engaged in.

(2) It must help the illiterate to interest himself in vital national problems and to participate effectively in the social and political life of the country.

(3) It must impart such skills in reading, writing and arithmetic as would enable him, if he so wishes, to continue his education either on his own or through other available avenues of informal education.

It follows that literacy programmes will have three stages. The initial stage will consist of acquaintance with reading, writing and arithmetic and some general knowledge relating to civic and national problems in which the entire society is involved and to the profession in which the learner is engaged. The second stage should deepen the knowledge and skills gained in the initial stage and train the adult in using literacy gained for solving personal problems and enriching personal life. The third stage should lead the adult to one of the programmes of continuing education.

17.15. **Programmes for Arresting the Growth of Illiteracy.** The first step to liquidate illiteracy should be to arrest the swelling of the numbers of illiterates by

— expansion of universal schooling of at least five years' duration as rapidly as possible to the age-group 6—11;

— providing part-time education to those children of the age-group 11—14 who either missed schooling or dropped prematurely out of the school; and

— providing part-time general and vocational education to young adults of the age-group 15—30 who have received some years of schooling but insufficient to carry them to a stage of permanent literacy or to prepare them adequately for the demands made on them by their environment.

17.16. In Chapter VII we considered programmes for the realization of universal primary education for the age-group 6—11. We have also recommended provision of part-time education of one year's duration for the age-group 11—14 on a voluntary basis to start with but with the hope of making it compulsory later when suitable conditions are created. We also consider it necessary that these facilities should be extended to those in the age-group 15+ whose schooling has been inadequate. These steps, combined with the extension of school facilities and improvement in the holding power of the schools, as proposed elsewhere, must form the base of a fight against illiteracy.

17.17. **The Strategy.** Planning for literacy must reckon with the magnitude and complexity of the situation obtaining in the country. It is not proposed to analyse the position in this chapter; but a picture of the size of the undertaking can be formed by the fact that there are, according to the 1961 census, 189 million illiterate adults (age-group 15+) in the country. Urban areas have a much higher literacy (47 per cent) than the rural areas (19 per cent). The map of literacy shows very wide variation from area to area in the country and ranges from 52·7 per cent in Delhi to 1·8 per cent in NEFA.[1] There is also a wide variance in literacy among men and women in different parts of the country, and among different social groups. Motivation for education varies from area to area depending upon several factors such as development of education and industrialization. Obviously there can be no single or simple approach to tackle the problem; each situation will need very special investigation and remedial measures will depend upon such opportunities as are locally at hand or can be made available. We feel that we can only indicate certain general principles.

17.18. We recommend a two-fold strategy for combating illiteracy in the country which, for the sake of convenience, we may call

(a) the selective approach; and

(b) the mass approach.

Programmes planned on the basis of the two approaches should go hand in hand; they should not be considered to be alternative.

17.19. **The Selective Approach.** The selective approach is specially suited to groups which can be easily identified, controlled and motivated for intensive literacy work. The specific needs of these groups can be ascertained and purposeful literacy programmes prepared to meet them. It is easier to handle such groups and investment on literacy for them can yield comparatively quick and gainful results. A further advantage of the selective approach is that the literacy programmes can include training which will advance the occupational and vocational interests.

17.20. By way of illustration, we suggest the following instances where selective programmes can be introduced immediately with great profit:

(1) Industrial and commercial concerns employ a considerable work force of which about 40 per cent are illiterate. The problem is big enough to need attention. We recommend that all employers in large farms and commercial, industrial, contracting and other concerns should

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[1] 1961 census figures.

be made responsible, if necessary by law, for making their illiterate employees functionally literate within a period of three years of their employment. The responsibility of educating them should be squarely on the employers who should release them, in accordance with an agreed programme, for such education. They should also provide incentives to the illiterates and otherwise induce them to make a serious effort to learn. Government should bear all educational costs and supply the teachers, books and other teaching materials. We have no doubt that enlightened employers will find it of advantage in the long run to educate their workers.

(2) We further recommend that the big industrial plants in the public sector should take the lead immediately and set the pace in this important programme.

(3) All economic and social development plans have their human aspect and involve a large number of persons who have had no schooling. It is, therefore, logical that every development project in whatever field —industrial, agricultural, commercial, health, education or any other —should include, as an integral part, a plan for the education of its employees, more especially of those who are illiterate.

(4) A series of schemes are launched by Government for economic betterment of the people for social welfare. For instance, the Khadi production scheme of the Khadi and Village Industries Commission or the scheme of applied nutrition and child welfare programmes of the Community Development Department, involve several lakhs of women. We suggest that literacy programmes should constitute an essential ingredient of all such schemes.

These illustrations are by no means exhaustive. Planners of literacy programmes should be on the look-out to locate and develop others.

17.21. **The Mass Approach.** The essence of the mass approach lies in a determined mobilization of all available educated men and women in the country to constitute a force to combat illiteracy and an effective organization and utilization of this force in a well-planned literacy campaign. This approach is unorthodox but not untried. Whereas the selective approach is tied down by its inherent limitations and is by its very nature ineffective as an overall solution, the mass approach can achieve a real break-through. The mass approach was a remarkable success in the USSR. In a different way and on a smaller scale this approach was attempted in Maharashtra through the scheme of Gram Shikshan Mohim. The Mohim exploited the local village patriotism to eliminate illiteracy from the village and required the teachers and all local educated men and women to work for literacy. The scheme cost very little and its gains were much more than what could be measured in terms of literacy. Its critics have referred to certain inadequacies in the preparation for the Mohim and to weaknesses in the follow up work. These defects can be remedied.

17.22. The responsibility for initiating a massive move to combat illiteracy goes beyond the capacity of the administrative and educational systems. It rests squarely upon the political and social leadership of the country. The success of this approach depends upon the strength of the conviction of those who are at the helm of national affairs, that illiteracy impedes national development as well as upon their ability to carry conviction to the people and to generate strong enthusiasm and motivation. We are convinced that if the nation is determined to make the country literate and to make the effort and sacrifice commensurate with the undertaking, India can become a literate nation within the foreseeable future.

17.23. Adult education is by nature a voluntary activity; the basic driving force is, therefore, the individual motivation of the adult. It may be clear to planners, educators and administrators that national security and integration, productivity and population control, health and general welfare of the people would improve through widespread adult education and training. This may not be so immediately apparent to the individual farmer or urban dweller that he would willingly sacrifice several hours in order to acquire such education. It is essential that the literacy programmes should be presented in ways which are meaningful to the adult and related in clear and understandable ways to the environment and to the conditions which he knows.

17.24. A mass literacy campaign depends largely upon the voluntary services of all educated people, including government servants, employees in public organizations, lawyers, doctors, engineers and others. But the main brunt of the campaign will fall on the teachers and students in schools and colleges and considerable responsibility for organization will fall on educational institutions of all kinds. We recommend that the students in the higher primary, secondary, higher secondary, vocational schools and those in the undergraduate classes of the universities and colleges should be required to teach adults as a part of the compulsory national service programme which we have considered elsewhere[1]. It is equally necessary to require the teachers in schools of all types to teach and to participate in the campaign when they are called upon to do so. Work for adult literacy should be a part of their normal duty. In order to help them to do so it may be necessary either to give them relief from normal school work or to remunerate them for adult literacy work. Their services should be available for work connected with adult education whenever required. Every educational institution should be required to run literacy classes regularly and should be given responsibility for liquidating illiteracy in a specified neighbouring area the size of which should be determined by the size of the school staff and the number of students available for literacy work.

17.25. **The New Function of the School.** The new responsibility related to adult education will imply a significant change in the function and outlook of the school. The area of its main concern will not be confined to the school children; it will embrace the entire local community which it serves. It will be required to function as a centre of the life of the community. It will need to be transformed from a children's school to a people's school. It follows that it will need to be equipped and serviced as a centre of the community and an important base for extension services. It will require, among other aids, a library, radio sets, exhibits, posters, models and other materials necessary for adult education.

17.26. **Conditions Necessary for the Success of Literacy Programmes.** A word of caution is necessary. No adult literacy drive should be launched without prior planning and careful preparation. While we do not suggest that years of study and survey of every area are necessary before a programme is launched, we believe that attention to the more important points mentioned below will pay dividends and avoid frustration:

(1) Before a programme is launched, all political, social and other leaders as well as all government departments should be involved in awakening interest and mobilizing support for it.

(2) The adult illiterates to be enrolled in the programme should be psychologically prepared and motivated for it. They must be made to realize what literacy would mean to them and feel convinced that such effort and sacrifice as they make will be worthwhile.

(3) The widest use should be made of the mass media of communication for awakening and sustaining the people's will to learn and for giving them general support throughout the operation of the programme and after. The radio, television, films, the spoken word, and all other media should be utilized for creating and maintaining an atmosphere which will be conducive to the success of literacy work.

(4) The material required for adult education programme should be prepared well in advance and should be available in sufficient quantities when the campaign is launched. These should include textbooks and other reading material, charts, maps, guide books and other instructional material and aids for the workers.

(5) Literacy programmes should be carefully planned with due regard to local conditions and requirements. In addition to imparting

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[1] Chapters I and VIII.

skills in reading and writing, they should help to improve knowledge and skills relating to the profession of the illiterate adult; make him aware of the important problems of the community, his country and the world and of the need for active participation in important national programmes such as population control and give him some understanding of the life and culture of the country.

(6) Literacy programmes should lead the neo-literate to continuing education. Literacy succeeds best when a person learns to use his knowledge to solve his problems through self-effort and to profit by the avenues to further knowledge such as schools, libraries and museums. A well-designed follow-up plan is an essential part of literacy programmes.

(7) It should be clearly realized that literacy programmes, as we visualize them, cannot be left to the teachers alone. The work of teachers should be supported by :

(a) extension services of the universities and of such departments as industries, agriculture, public health, cooperatives, community development. These extension services should mainly help to improve knowledge, skills and practices related to the professions of the people; and

(b) mass media of communication and more particularly All India Radio should be used for awakening the consciousness of the adult illiterates towards their responsibilities to civic life and to vital programmes of national development.

(8) The effects of literacy programmes will be shortlived unless they are supported by the establishment of libraries and a continuous supply of good reading material and newspapers.

(9) A carefully thought-out plan of action should envisage the training in advance of the local leadership including civic and other authorities. Those involved should be acquainted with the details of the action planned and with the specific role they are required to play in carrying it out.

(10) Students and educated persons who volunteer to teach should be given a short training in the methods of teaching and dealing with the adults. They should also be provided with guide-books and other helpful material.

(11) An efficient machinery for administration and supervision is needed and should ensure involvement of voluntary agencies and support of vigilant evaluation and research.

(12) Planning for literacy must visualize the activities which should continue after the intensive literacy campaign concludes. Those involved in the literacy programmes should be encouraged to help one another to continue to learn and to this end, constitute study groups, associations, clubs or recreational groups.

(13) Public commitment, support and enthusiasm are vital to the success of the literacy programmes. Public appreciation of the success of the programme, its concern when the activities slow down, its participation in improving its procedures, its encouragement of those who do outstanding work are all factors of extreme importance. Public involvement and support should be kept alive with the help of newspapers, leaders of social and political life, of learned societies, and other agencies.

17.27. **Literacy for Women.** The state of literacy among women is particularly distressing. The Census of 1961 showed that 34.5 per cent of the women in urban areas and only 8·9 per cent of them in rural areas were literate. It is universally acknowledged that unless women become educated, there is little hope for social transformation. Yet efforts to make adult women literate are negligible. We cannot too emphatically recommend the urgency of initiating bold, imaginative and effective measures for stepping up literacy among women, particularly those in the rural areas. It is unnecessary in this Report to consider at any length what factors hinder operation of literacy programmes among women. It is well known that motivation to learn among women is weak; the social environment tends to be hostile for organizing literacy campaign among women; the women themselves have little leisure and they certainly cannot count on hours when they will be free to learn. The most difficult problem is to find teachers for women. Some of the difficulties will be solved by the suggestion we have made for employing school children to teach; children could be made to deliver education to women at their door step at hours convenient to them. There would be little social objection to the 'little teachers' visiting homes for teaching women.

17.28. It is hoped that more and more women teachers will be appointed in schools and that they will be specially made to undertake the responsibility of teaching illiterate women in areas served by the schools. We see great potentiality in the scheme launched by the CSWB to provide 'condensed courses' to women whose education remained incomplete and to give them further training in some field such as teaching and nursing. We also suggest appointment in the villages of 'village sisters' for teaching village women and organizing adult education among local women. As far as possible, the 'village sister' should be a local woman, paid a small salary to do adult literacy work. She should be trained and periodically retrained to keep her informed of the new techniques of adult education work. In the urban areas, it should be possible to utilize government pensioners and retired persons for literacy work among women.

17.29. **Role of Radio, Television and Audio-visual Aids.** We have taken the view that the existence of the vast masses of illiterate and uneducated persons seriously handicaps national life and growth and that, therefore, their education cannot wait without peril. It is also apparent that illiteracy is slow a-dying and that with the best of national efforts and sacrifices, full literacy may require even two decades to be achieved in some parts of the country. Moreover, it is realized that it takes time to be able to use literacy: to select what to read and to comprehend what is read. Even those who have had fairly long formal education require educational maturity to make good use of the ability to read. However, education of the people should not wait till they become literate; it should precede, accompany and follow the programmes of literacy. To this end we have recommended fullest exploitation of the mass media of communication and films and other audio-visual aids. In fact the cinema, radio, wall posters, pictures and the like are already educating the illiterate and the literate alike. The choice is not between education and no education but between education which is necessary for national growth and integration and that which is given just to please and to recreate. The mass media of communication should be effectively used as a powerful instrument for creating the climate and imparting knowledge and skills necessary for improving the quality of work and standard of life of the people. In this connection we had contemplated recording comprehensive recommendations for utilizing the services of radio and television for adult education. Our task, however, has been considerably lightened by the report of the Committee set up by the Ministry of Information and Broadcasting under the chairmanship of Shri A. K. Chanda[1]. In appropriate paragraphs of this chapter we have referred to the special use which should be made of All India Radio and television for the various adult education programmes. We also generally support the recommendations made by the Committee on Broadcasting and Information relating to the role of radio and television in the field of adult education. We agree with the Committee that while television is a more suitable medium for adult illiterates, both television and radio can and should be used for carrying general education to comparatively less educated people and even to illiterates and that it should be used as a medium for improving production and for bringing about social transformation. In the conditions of modern life, radio, television and cinema have an important role to play in determining public attitudes and tastes. It is necessary, therefore, to use them for human and national good. There can be no better instrument for imparting useful knowledge to the masses of people and for making them understand what the country stands for and what it is struggling hard to achieve.

17.30. **The Follow-up.** All campaigns by their very nature must come to a close; but not literacy campaigns. The very purpose of the literacy campaign will be defeated if it did not continue in some form to keep the process of learning alive. The concern often expressed that there is a rapid relapse into illiteracy following a literacy campaign is justified by experience. The apprehension becomes greater when limited financial resources and lack of trained personnel make it necessary to employ voluntary services of students and teachers for teaching the illiterate. Retention of literacy acquired depends upon continued use of it for achieving some life purpose. We have suggested the urgency of creating motivation to learn as a preparation to the launching of literacy programmes. In fact, education of the people should begin with the help of mass communication media and other means to make people aware of the social, economic and political context of life. The need for literacy should be felt by the illiterate and he should realize what he misses without it. It is equally necessary that while he learns to read and write he should also learn what use he can make of his knowledge. Employment of students and educated volunteers for teaching illiterates is dictated by circumstances, but they can take the adults only very little ahead. They can impart knowledge of reading and writing and numbers and make the illiterate understand some problems of personal and civic life. After this initial stage, the teaching should be handled by regular teachers in schools and the neo-literates should be gradually led to the various forms of informal education which we discuss later. One of the main ingredients of literacy programmes should be to teach the adult to use the library both for pleasure and for profit. In substance we emphasize that, what is known as 'follow-up' programme is not different from literacy programme. The essential elements of the 'follow-up' work should be in-built in the literacy programme itself. It is a mistake to think that the activities grouped under the 'follow-up' procedures should be undertaken after the literacy campaign is over and adults have learnt to read and write. In the coherent whole of a literacy programme there should be elements which are necessary to make literacy enduring and useful. Literacy work once undertaken should merge into one or the other of the variety of forms of adult education and the process of learning once begun should be encouraged to continue.

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[1] *Report of the Committee on Broadcasting and Information Media*, Ministry of Information and Broadcasting, New Delhi, 1966.

17.31. We have suggested that planning for literacy and adult education programmes must include preparation of a variety of material which should be available whenever required. The most important material consists of textbooks and other books for the neo-literate and a variety of other literature, such as newsletters, magazines, pamphlets containing useful information relating to some aspects of agriculture or science or craft or any other matter of interest to the adult. Equally important is the preparation of guide-books and the production of literature which will be of help to the vast army of volunteer-teachers. It is also necessary to prepare charts, maps, models, films, filmstrips, and a vast variety of other audio-visual aids. The task is colossal and will demand considerable ingenuity and organization. If material is not ready, literacy programmes will be held up. It will never be too early to take up this earnestly and produce at least the books for the illiterate and their professional and non-professional teachers. Linguistic considerations and the magnitude of the demand in each language would indicate the need for setting up a competent production unit in each State. Treatment of the local problems and matters of local interests should make the books interesting. There should, however, be inter-State cooperation in order to ensure that the literature produced furthers national policies and strengthens national integration and patriotic sentiment. Inter-State cooperation may also help in certain cases to reduce cost of production. We feel that the Ministry of Education should take the lead and organize inter-State and inter-departmental cooperation for production of literature required for literacy and adult education programmes.

CONTINUING EDUCATION

17.32. **Significance.** Illiteracy must in time disappear and the school system ensure against its recurrence. Adult education, however, has an enduring function in the national system of education. In conditions of rapid change and advancing knowledge, man must continue to learn in order to live a full life. Learning is the way of civilized living.

17.33. The principle is now well recognized that a modern system of education does not merely provide wide-spread full-time education of different types and at different levels; it includes a wide range of courses and forms of instruction which an adult outside the full-time school system needs for his personal, professional, social and other interests. Thus conceived, continuing education 'becomes the growing and the harvest for which formal schooling is only the planting and the cultivation'. It is no wonder that in advanced societies adult education tends to become the fastest growing segment of education.

17.34. **General Recommendations.** Broadly speaking, the system of continuing education should be designed to suit two different groups of people. The first of these consists of those who can join with others to form groups for part-time study in educational institutions or *ad hoc* classes of instruction in specific subjects organized by various agencies such as the departments concerned with development, or universities, boards of secondary education or institutions for technical, vocational or agricultural education, or learned societies and voluntary organizations. The second is composed of those who must study at home during such hours as they can find for the purpose, but who require assistance to be delivered to them at their convenience. Adult education must be designed to serve a great variety of purposes and different groups which vary not only according to their educational attainments but according to their occupational interests, cultural aspirations and sensitiveness to responsibility in public affairs. We have earlier referred to those who had to leave schooling before completing the primary stage of education and suggested they should be enabled to complete the stage. There are others who desire to go up the ladder of formal education leading to university degrees in various faculties including those of science, technology and agriculture. There are also those who are working on farms, workshops, factories, commercial houses as well as those who are self-employed who need training for improving their efficiency. Even those engaged at high professional levels need to refresh their knowledge and become acquainted with the new thinking and practices in their fields of specialization. More particularly, teachers at all stages of education, including the university, must have opportunities of keeping themselves abreast of the advancing frontiers of knowledge. This also applies to lawyers, doctors, business managers, industrial chiefs and others at the top of their professions. There are also those who wish to learn something just for the joy of it, for example, a foreign language, or painting, or music or interior decoration or cookery or flower arrangement or something else unconnected with their occupation in life. Adult education must be tailored to suit all tastes and needs. What is of significance is that good imaginatively designed courses covering a varied range of interests themselves serve as powerful media for creating incentives to learn.

17.35. We recommend that educational institutions of all types and grades should be encouraged and helped to throw open their doors outside the regular working hours to provide such courses of instruction as they can to those who are competent and desirous of receiving education. This is the approach which is favoured throughout the world; but in the conditions of our country its acceptance is acutely necessary because the circumstances of history have forced many to begin life without proper education or training. We thus suggest the creation of a parallel system of education for those who can attend educational institutions only during a few hours they can spare in the evenings or at other convenient times in order to enable them to qualify for the same certificates, diplomas and degrees as those for which the regular students in the educational institutions work. We are aware of the recent development of the evening colleges in several parts of the country. We hope that the evening colleges in several parts of the country will provide good education in an atmosphere which will encourage learning rather than merely serve to enable those outside the regular system to purchase eligibility to appear at the examinations by a nominal recording of attendance. Not only the secondary schools and colleges but all institutions and more particularly the vocational, technical and agricultural institutions should provide part-time education outside their regular hours.

17.36. Educational institutions should also give the lead in organizing *ad hoc* short courses which will help people to understand and solve their problems and to acquire wider knowledge and experience. Short courses in soil management, use of fertilizers, poultry farming, orchard growing, care of children, nutrition, and nursing could be cited as illustrations. The scope of such activities is unlimited, provided there is proper planning and cooperation of the departmental machinery of government, the universities, colleges, technical institutions and local leadership. It is not enough that such courses should be organized; it is more important to create motivation to learn among the people and to organise groups interested in different courses.

17.37. **Education of Industrial Workers.** We have already emphasized the urgency of selective approach to educate the workers in organized industries and suggested that they should be made literate within three years. We have also suggested that their education should be a cooperative endeavour of the employers, who should provide time and other amenities and incentives and of education departments which should prepare programmes for education and provide teachers, books and other assistance. In view of the important role which the working classes play in improving production, their education should not be allowed to end after they have become functionally literate. We, therefore, recommend that further education should be provided for workers for improving their knowledge and skills, widening their horizon in life, inculcating in them a sense of responsibility towards their profession and improving their careers. Special part-time and sandwich courses should be offered for them which would lead them step by step to higher courses.

17.38. In this connection a crucial measure will be to institute special courses for the industrial workers which would be comparable in quality and standard with those for the high and higher secondary courses for the regular school students. It is necessary to recognize the marked distinction between the ages, attitudes and aspirations of the comparatively grown-up, realistic and practical workers in the factories and the care-free adolescents in the schools who are not attached to any specific occupation in life. This distinction tends to wear off with age as the products of the school move into institutions of higher education; but its unique significance at the secondary level should be expressed in terms of the differentiated part-time and correspondence courses for the workers which should stress their mature needs and special occupational and other interests.

17.39. An immediate beginning should be made in this direction by the Central Board of Secondary Education. Industrial plants in the public sector should also take the lead in organizing classes for workers and encouraging them to work for these examinations. Part-time courses would help the workers still further through specially designed programmes to attain as high standards as possible in various fields of general, technical, managerial and other types of education with which the future of the worker is concerned.

17.40. Education of the workers should be the joint responsibility of the Ministry of Education and the Ministry of Labour and Employment. The organizational aspect of education for industrial workers should be the responsibility of the Ministry of Labour and Employment which should arrange classes of different groups, release the workers for receiving education at reasonable hours, provide amenities such as classrooms, libraries, reading rooms, and laboratories where possible and above all offer incentives to those who show good progress. The Ministry of Education should organize preparation of different types of programmes and courses required for industrial workers in consultation with the Ministry of Labour and Employment, employers, universities, board of secondary education and those in charge of technical education. The Ministry of Education should also provide teachers, textbooks and other amenities and should obtain for the education of the workers such assistance as the neighbouring institutions for general and technical education can provide.

17.41. Adult education for the industrial workers should be designed with the utmost care and with a sense of purpose. Efforts should be made to avoid imbalance observed in some of the existing programmes which either lay almost exclusive emphasis on the working of trade unions, labour policies and the like or on literacy and recreational activities. The main function of these programmes should be to equip an increasing number of workers with higher technical and vocational qualifications so that they can rise to positions of reponsibility within the industry. Thus viewed, the education of workers cannot be considered in isolation from the main streams of general, vocational and technical education. As we have emphasized elsewhere, schools for general and vocational education, colleges, boards of secondary education, universities and technical institutions should undertake increasing responsibilities for the education of the industrial workers.

17.42 **Special Programmes and Institutions.** It is not possible for the part-time courses in school and college systems to cover all the varied needs of adult education since some of them will require special institutions. For example, our attention has been drawn to the valuable work done by the institutions brought into being by the CSWB which provide 'condensed courses' to train partially educated women for a variety of social services and thus rescue them from helpless unemployment. We have already suggested the urgency of training as large a number of women as possible for working as 'village sisters', teachers, nurses and other social workers. It follows that centres for condensed courses should be multiplied and selected educational institutions such as colleges, high schools, teacher training institutions should be strengthened with staff and other requirements to provide this training. We have also been impressed by the account given to us of the rural institutes and institutions like the Vidyapeeths in Mysore State. The Vidyapeeth functions in some ways like the folk high schools of Denmark and provides general as well as practical education to selected groups of the rural people brought into residence for short periods. Education in these institutions is, as it ought to be, production-oriented and lays emphasis on agriculture and rural crafts. Some of the rural institutes provide brief courses to groups of chairmen and office-bearers of village panchayat samitis in order to help them to appreciate the responsibilities of their office and the democratic procedures which govern all civic decision-making. We suggest that the working of the Vidyapeeths and the rural institutes should be frequently reviewed in order to enable them to be of service to the rural community. The staff for such institutions must be of the highest quality and very specially trained. It is necessary that these institutions should work in close collaboration with agricultural demonstration farms and centres for extension services. More such institutions are necessary; but the expansion should be limited to availability of competent staff and other supporting services.

17.43. Organization of part-time courses for adults bring added responsibilities to the educational institutions and it is obviously the responsibility of Central and State Governments to ensure that the institutions have the necessary requisites to discharge these new functions. The institutions must have extra staff for the new services which they are required to render, adequate supply of books, teaching materials and aids, libraries and laboratories. The methods of teaching part-time students would be different and the fullest advantage should be taken of the fact that they will have strong motivation to learn. It is equally important that there should be no relaxation of standards to help them. If necessary, the duration of the courses should be lengthened somewhat to make it easier for the part-time students to pursue them.

CORRESPONDENCE COURSES

17.44. There must also be a method of taking education to the millions who depend upon their own effort to study whenever they can find time to do so. We consider that correspondence or home-study courses provide the right answer for these situations.

17.45. The correspondence or home-study course is a well tried and tested technique. Experience of correspondence courses in other countries of the world, such as the USA, Sweden, the USSR, Japan and Australia, where they have been used extensively for a long time, as well as the limited and brief experience at the University of Delhi, encourage us to recommend fuller exploitation of the method for a wide range of purposes. There is hardly any ground for the apprehension that correspondence courses are an inferior form of education than what is given in regular schools and colleges. Experience abroad and experiments in India have shown results which, on balance, tend to strengthen the case for *correspondence education.*

17.46. The home study method no doubt lacks the inspiring contact with the teacher. But inspiring teachers are rare, and in correspondence study the adult has a strong motivation to learn. The method also establishes a personal and private relationship with the teacher which encourages discussion and understanding through written communication thereby ensuring relevancy and precision. In fact, there can be no effective education through correspondence without this private and purposeful relationship between the student and the teacher, whereas in many indifferent and over-worked schools and colleges there is hardly any worthwhile contact between the teacher and the taught. The mere fact that the major effort to learn has to be made by the student himself in the correspondence method and that he is required to do a variety of exercises and tests in writing, which are guided and supervised, substantially support the educational value of the method.

17.47. Correspondence courses should not mean mere exchange of written instructions and exercises. One essential aspect of the method is that the teachers and the taught meet occasionally even if it be for a brief while and participate in specially devised programmes which include lectures, seminars and group discussions. Those studying science or technical subjects should have access to a laboratory and workshop during week-ends or in vacation time. A variety of other means can enrich correspondence procedures. Correspondence course students living in a locality and interested in common subjects can form self-study groups and help one another. It is essential that they should be given the status of recognized students, and where possible, they should be attached to some colleges and allowed the benefit of the use of the library and such other amenities as seeing educational films, listening to recorded speeches of distinguished scholars, and attending extension lectures.

17.48. Correspondence or home-study courses which are sequenced in accordance with the principles of programmed learning are of enormous benefit in certain fields of education. It has been pointed out that the programmed procedures give good results when a student is introduced to a new subject and required to grasp its fundamental concepts. We feel that it would be profitable to experiment with the application of the methodology of programmed learning in correspondence courses.

17.49. Correspondence courses should be supported by well-coordinated radio and television programmes. It is not possible at this stage to have a regular university of the air; but radio and television can illumine the more fundamental and sensitive themes in the different areas of study. We consider it necessary that the universities and other agencies dealing with the correspondence courses should join with the All India Radio and Television and prepare a variety of radio and television programmes which will be of value to those who are studying through correspondence courses. A good beginning can be made by 'broadcasting' specially prepared talks and discussions on the more important themes of the correspondence courses organized by the Delhi University.

17.50. Correspondence courses should not be confined merely to helping students to prepare for university degrees. Important programmes of correspondence courses could be organized to provide suitable courses of instruction in subjects which will help the workers in industries, agriculture and other fields to improve production. Some of the subjects in which courses can be organized are landscaping and gardening, architecture, plumbing, diesel engine, drafting, engineering, business administration, building construction and blueprint reading, surveying, firemanship, mathematics, sheet metal, auto mechanics, commercial art, electronics, radio, television servicing and broadcasting, auxiliary nursing, vocational rehabilitation subjects, industrial electronics and automation, dress-making, business and secretarial subjects, air conditioning, heating, refrigeration, criminal and civil investigation, traffic management, hotel management, factory management and executive training, airline training, photography, professional lock-smithing, upholstery and real estate[1]. Good correspondence courses in thoughtfully identified fields of service will create demand for themselves and can help participation by the people in introducing better methods of production.

17.51. Correspondence courses should be available for those who desire to enrich their lives by studying subjects of cultural and aesthetic value such as languages, philosophy, history, politics, economics. art appreciation, literary criticism, psychology and the like. These subjects indeed bake no bread, but while they do not directly assist economic growth they help to improve intellectual and aesthetic standards and to transform outlook on life.

17.52. It is obvious these universities should not be the only agency which should organize correspondence courses. Provision of correspondence courses should also be one important function of the extension service of developmental departments of government such as agriculture, industries, cooperation, health. This should prove to be a valuable method of conveying to the educated and the neo-literate alike such knowledge and improved techniques as the departments concerned wish to put across.

17.53. We also recommend the institution of special programmes of correspondence courses for teachers in our schools in order to keep them abreast with the new knowledge in the subjects they teach as well as with the new methods and techniques of teaching. This measure is particularly necessary in the depressing background in which teachers have to work in schools in which library facilities are poor and where there is little intellectual communication. It would also help teachers to feel secure about what they teach and perhaps inspired by the new challenges.

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[1] See Chapters XIV and XVI.

17.54. The Ministry of Education in collaboration with other Ministries should establish a National Council of Home-Studies. The Council should be authorized to assume many functions including accreditation and evaluation of agencies. It should identify areas in which different types of correspondence courses would be of benefit and establish them on their own or assist Government departments, universities, boards of education, institutions of technical education and private agencies to create them. It should also carry out continuous evaluation of the various programmes of education through correspondence.

17.55. Some controversy surrounds the costs of correspondence courses. One view maintains that correspondence programmes cost as much as, if not more, than regular education in schools, colleges, and other institutions. Another view holds that as large numbers are involved in correspondence courses, it should certainly cost much less than regular education in residence. It is not easy to compare the costs in different countries because the assumptions vary. However, it is worth pointing out that supervisory staff requirements do not rise relatively to the increase in numbers and the advantage of superior staff reaches a very wide range of students. The student works and earns while he studies and if he is a productive worker, he continues to help production. If his correspondence course helps to improve his knowledge and skills relating to his occupation, he will be better able to do his job. For him there need be no separate building and equipment, no playgrounds and gymnasia, no hostels and special tuitions, no special libraries or laboratories.

17.56. We also recommend that it should be possible for private candidates—whether employed or not—to take any or all of the examinations conducted by the secondary education boards and universities in the country. Many serious-minded adults (or even young persons), and particularly girls and women, are unable to take these examinations conducted by the secondary education boards and universities in the country, because they are unable to fulfil the usual conditions relating to attendance. There is no reason why they should not be encouraged to depend on their own effort to prepare for these examinations.

LIBRARIES

17.57. We have referred to the need of libraries in different parts of this chapter and we think that a good library system which brings books within the reach of all is the backbone of the system of adult education. Without this there is little hope for cultivating reading habits among adults particularly in rural areas, where book distribution is difficult. The Working Group of the Planning Commission has recommended a scheme for large-scale establishment of libraries in the country. We generally agree with its recommendations.

17.58. We also accept the major recommendations of the Advisory Committee on Libraries (1957) relating to the establishment of a network of libraries throughout the country, including a National Central Library at Delhi, Regional Libraries in Bombay, Calcutta and Madras, a State Central Library in each State, and libraries at the district, block and panchayat levels. This would form the framework which would sustain widespread library growth and organized services throughout the country.

17.59. School libraries should be integrated with the system of public libraries. We have laid stress on schools being made centres of adult education and extension services. It is, therefore, necessary to develop and assist school libraries to perform this new function. Even the remotest primary schools should be serviced by a neighbouring public library.

Libraries will need reorientation in order to function as media of adult education. They will need to be stocked with reading material which will lead the neo-literate step by step from simple but interesting reading to more advanced books giving information of value to him. Libraries will also require books and other reading material which will have a bearing on the practical needs and tastes of the adults. Wherever possible, libraries should have stocks of tape records, gramophone records, and films and other useful aids. The libraries will also be used by those who take part-time education, those who take correspondence courses and those who depend on their own efforts. It is necessary that their needs should find a place in the equipment of libraries.

17.60. Libraries should not remain, as they tend to do, mere store-houses of books; they should be dynamic and set out to educate and attract adults to use them. There are many known ways of performing this function. One which conforms to the age-old traditions of adult education in the country is collecting an audience for hearing some book or poem of interest read out. Lectures, discussion groups, book-clubs should be initiated and attempts made to make the library a centre of interest for the community. By way of illustration we refer to the useful work done by the Delhi Public Library which has not only encouraged people to become book-minded but has endeavoured to make the library a dynamic centre of a variety of cultural activities.

THE ROLE OF UNIVERSITIES IN ADULT EDUCATION

17.61. **Significance.** The image of the university as a closed academic community of scholars creating and disseminating knowledge and perpetuating its own type is a thing of the past. The walls which divide the gown and the town have crumbled and the life of the university and that of the community can be vitally linked for their mutual enrichment.

17.62. This change of attitude is noticed in a marked way in some of our universities which have organized correspondence courses, extension lectures and seminars for the benefit of extra-mural students. The correspondence courses introduced by the University of Delhi have already created a demand for more such courses. The establishment of the Department of Adult Education by the University of Rajasthan is a welcome move and much is expected of it. We feel that the universities in our country must take upon themselves a much larger share in the responsibility for educating adults.

17.63. **Programmes.** The function of the university is to help the social, economic, educational and cultural growth of the community which it serves. With its specialized agencies it can create a wholesome impact on certain sensitive areas of economic, social and cultural life of the people. One significant way in which it can give a lead is to communicate to the people the new scientific findings and new thinking on social and economic problems. Similarly, universities can effectively undertake a variety of programmes for re-education of the key personnel of the different professions. In this context, a special mention of re-education of the teachers is relevant. The need is so urgent and the problem is so vast that the country would naturally look to the universities for effective leadership for re-educating the teachers and keeping them fully informed of the new teaching practices and methods, new philosophies of education as well as developments in the various fields of knowledge with which they are concerned. They can also help in building up healthy attitudes of the community towards some of the fundamental national problems, such as those of public health, sanitation, population control, and building up of national solidarity. The universities should also organize programmes which will brief the national leadership in civil and political life as well as the people and acquaint them with knowledge and wider experience pertinent to decision-making on some of the vital problems challenging national life. They should also help to raise the standard of national tastes as well as habits of life and social behaviour of the people. There is no end to the good which the university can do to the community. It is, however, necessary that each university should measure its own opportunities and plan the best that it can do to be of service to the society which it serves. We have already referred in other parts of this chapter to what universities should do to assist eradication of illiteracy from the country and training of the leadership for the purpose.

17.64. The universities alone can think out the ways in which they can organize their services to the community in accordance with the means at their disposal. It is usual to organize evening classes for adults who are employed during the working hours and to prepare them for university examinations. The organization of special study groups and short-term special courses for professional benefit is also urgently needed, as well as a variety of extension programmes, including lectures, field work, demonstrations, and cultural and recreational activities. Universities should in addition organize social service camps and adopt villages for intensive programmes for development and eradication of illiteracy as well as for maintenance of schools and other similar social services, the improvement of agriculture, local industries, and working of cooperatives. Here again, there is no end to the ways which a university can adopt for making their extension service effective.

17.65. **Administration and Finance.** The universities should have an efficient machinery for launching carefully planned adult education programmes and for evaluating achievements. We suggest the establishment in each university of a Board of Adult Education which will include representatives of all departments involved in preparing and executing adult education programmes. The vice-chancellor should be the chairman of the Board. It should lay down policies as well as plan programmes and direct their operation jointly by the various departments of the university. It should also evaluate the success of the programmes. We also feel that some universities in the country should develop full departments of adult education. The purpose of such departments should be to train specialists and teachers in the field of adult education, to undertake and to guide research in all problems connected with adult education in cooperation with other relevant departments such as education, sociology, and psychology and to cooperate with the proposed Board of Adult Education in producing inter-departmental programmes of extension service and helping in their fulfilment.

17.66. Needless to say, the universities should be specially financed and equipped for the purpose of the adult education work which they undertake. The normal resources of the university will be inadequate in initiating extension services. It is true that most of the work will be done on a voluntary basis but universities will require some additional staff and special libraries, which will include films, tape libraries, audio-visual aids, suitable transport, camping equipment and other educational aids. We are convinced that the assistance given to the universities to organize adult education programmes will be fully rewarded.

ORGANIZATION AND ADMINISTRATION

17.67. We have already seen that one of our major weaknesses in work in the field of adult education in the past has been the absence of an overall plan and of coordination of efforts by different governmental and voluntary agencies.

17.68. **National Board of Adult Education.** To overcome these defects, the Report on Social Education of the Committee on Plan Projects recommended the establishment of a Central Board of Social Education. The National Seminar on Adult Education held at Poona in 1965 recommended the creation of a National Board of Adult and Literacy Education. We recommend the setting up of such a National Board on Adult Education on which all relevant Ministries and agencies would be represented. The initiative for its creation may be taken by the Ministry of Education. Its functions would be:

(1) To advise Governments, at the Centre and in the States, on all matters relating to informal adult education and training and to draw up plans and programmes for their consideration;

(2) To promote the establishment, where needed, of agencies and services for the production of literature and other teaching material and for the needed training programmes;

(3) To ensure coordination among different Ministries and official and non-official agencies;

(4) To review from time to time the progress made and to formulate suggestions for change and improvement; and

(5) To promote research, investigation and evaluation.

Similar bodies should be set up at the State level. Committees at the district level, acting as wings of Zila Parishads where these exist, should also be set up, supported by *ad hoc* committees of block and village panchayats. At the village level, the schools should be developed as community centres. At the village, block and district levels close cooperation with agriculture, health, cooperative, community development and other extension programmes must be ensured:

17.69. **Adult Education—a Total Governmental Function.** We wish to lay stress on the fact that the pluralism of adult education and its wide and varied range, preclude it from being regarded as the sole concern *of a single department in a Ministry which* handles it administratively. It is necessary to recognize it as a business of every department, and the entire administrative machinery not only at the planning but also at the implementation levels must be involved in the preparation and unfolding of its programmes. The functioning of adult education cannot admit of departmentalism and we have been told that the work in the field has suffered to no small extent because of its rigid administrative aloofness. It is true that adult education is mainly the function of the Ministry of Education but it is necessary to adopt procedures which will ensure practical involvement of the entire administrative machinery.

17.70. **Voluntary Agencies.** Voluntary *agencies working in these fields should* be given every encouragement, financially and technically. Adult education is an area ideally suited to voluntary effort and the work to be done is of such dimensions that the mobilization of this will play a crucial role in the success of our plans.

PART THREE

IMPLEMENTATION

This part of the Report deals with problems and programmes of implementation and covers two chapters—XVIII and XIX.

Chapter XVIII deals with educational planning and administration. Among others, it deals with such problems as educational planning, the roles of private enterprise, local authorities and the Government of India, educational administration at the national and State levels, personnel of the Ministry of Education and the State Education Departments and procedures.

Chapter XIX examines issues relating to the financing of education. Among others, it deals with the growth of total educational expenditure in India during the post-independence period and the resources likely to be available for educational development during the next twenty years. It also deals with the allocation of available resources to different sectors of education as it was in the first three plans and as it is likely to be in the next two decades. It discusses the different sources of educational finance and broadly indicates the cost per student at each stage of education as it was during the last fifteen years and as it is likely to be during the next twenty.

There are four important notes at the end of Chapter XIX.

Note I deals with grant-in-aid from State Governments to local authorities—urban and rural—and the Centre-State relationship in the financial support to education.

Note II deals with tentative estimates of expenditure on the development of school education (1966—85).

Note III deals with tentative estimates of expenditure on the development of higher education (1966—85).

Note IV gives a summary of the studies conducted by the Education Commission in the unit costs of higher education in a few universities and colleges.

CHAPTER XVIII

EDUCATIONAL PLANNING AND ADMINISTRATION

I. *Educational Planning.* (2) The basic problem; (3) Some suggestions for reform; (5) Different levels of priorities; (7) Re-definition of the roles of the different agencies providing education.

II. *The Role of Private Enterprise.* (9) The present position; (11) Recommendations.

III. *The Role of Local Authorities.* (12) The present position; (17) Recommendations; (18) The district and municipal school boards.

IV. *The Role of the Central Government.* (25) The present position; (26) Recommendations; (29) Should education be in the concurrent list ?

V. *Educational Administration at the National Level.* (32) Ministry of Education; (36) NCERT.

VI. *Educational Administration at the State Level.* (38) Co-ordination; (40) The Education Secretariat; (42) Directorate of Education.

VII. *Personnel.* (44) Indian Educational Service; (50) The State Educational Services; (51) Training of educational administrators; (53) National Staff College for Educational Administrators; (54) Increasing the strength of the department.

VIII. *Procedures.* (55) The present position; (56) Introducing elasticity and dynamism; (57) Education Acts.

18.01. In the present chapter, we shall deal with educational planning and some major aspects of educational administration which have not been dealt with before and in particular with administrative responsibilities and arrangements at the local, State, and national levels and their interrelationships

EDUCATIONAL PLANNING

18.02. **The Basic Problem.** The crux of the problem of educational planning in India is to evolve a national policy in education in spite of the fact that education is largely a State subject in the Constitution and that a multiplicity of authorities at different levels make decisions on all aspects of the situation. This is not an easy task and as there is little similar experience to guide us, we will have to evolve our own techniques in most cases. It is also necessary to review and improve our planning techniques.

18.03. **Some Suggestions for Reform.** A review of the first three five year plans in the different States and at the national level highlights the need to improve the planning techniques in some directions. These have been indicated below.

(1) *Over-emphasis on Enrolment and Expenditure.* There has been an over-emphasis on achievement of targets in enrolments and expenditure. It is true that expansion was badly needed and expansion will have to continue. But an over-emphasis on this aspect leads to the neglect of the still more important aspect of quality. Similarly, an over-emphasis on expenditure targets tends to distort priorities and often leads to wastage. There is thus a need to take a more comprehensive view of the problem and to evolve a broader pattern of goals, especially those relating to qualitative improvement.

(2) *The Need for Concentration of Effort and Adoption of a Selective Approach.* Throughout the first three plans, the general policy has been to do something in every sector or for every programme with the result that the meagre resources available were spread thinly over a very large area. This policy involves considerable wastage. It has, therefore, now become important to concentrate on a few crucial programmes such as improvement of the quality of teachers, development of agricultural education provision of good and effective primary education for all children, liquidation of illiteracy, vocationalization of secondary education, establishment of major universities, expansion and improvement of postgraduate education, increase in the number of scholarships and the development of about ten per cent of institutions at each stage to optimum levels of quality.

(3) *Emphasis on Programmes which Need Talent and Hard Work.* The emphasis on reaching expenditure targets to which a reference has been made tends to place a premium on programmes where it is easy to incur expenditure, e.g., construction of buildings or expansion of enrolments. This is unfortunate because there are a number of

programmes which call for determined effort, organization, talent and hard work rather than large financial investment. The following are some examples of such programmes :

- production of literature in the modern Indian languages needed for their adoption as media of education at the university stage;
- educational research;
- examination reform;
- preparation of school textbooks and teaching and learning materials;
- in-service education of teachers and officers of the Education Departments;
- improving techniques of supervision;
- improving contact with the local communities and parents;
- providing enrichment programmes and guidance to gifted students and some special assistance to retarded or backward ones.

A number of instances of this type can be cited. What is important to note is that, in the existing situation where the financial resources are limited. it is programmes of this type that need far greater emphasis than those which need heavy financial investment.

(4) *Lack of Adequate Evaluation and Research*. Yet another weakness in our planning is the inadequacy of evaluation and research. Since planning is a comparatively new process and we have to evolve our own techniques, it is necessary to evaluate our programme continuously and develop a strong research programme which will enable us to cut down costs and increase the effectiveness of the investment in education. But, by and large, this has not been done. Some attempts at such evaluation have been made recently in the Planning Commission *viz*., the COPP Teams have studied three problems[1], two of which were not of a major magnitude. What we would recommend is the deep involvement of universities, professional organizations. training colleges, etc., in a periodical evaluation of all major programmes included in the plans and in the development of a large-scale research programme on the lines recommended elsewhere[2].

(5) *Weakness of Existing Machinery for Educational Planning*. The existing machinery for educational planning leaves much to be desired. It is not adequately staffed nor is the personnel engaged in it suitably trained. There is hardly any educational planning done at the district level. The planning cells in the offices of the Directors of Education are inadequate and staffed mostly by persons who have had no training in the field. Their work also is mostly administrative and financial and confined to the compilation and reporting of educational and financial statistics.

18.04. There is need to improve the organization and methods of educational planning and for training competent personnel to staff the planning units in the Central Ministry of Education, the State Departments of Education and District School Boards. It should be possible for the Ministry of Education, in collaboration with the Asian Institute of Educational Planning, to undertake studies of educational planning in the different States and to conduct intensive courses for training the personnel involved in the process of educational planning in India. The subject is of such great significance that the UGC should also consider the possibility of setting up an Advanced Centre for Studies in Educational Planning, Administration and Finance.

18.05. **Different Levels of Priorities.** Education is essentially a responsibility of the State Governments. But it is also a national concern and in certain major sectors, decisions have to be taken at the national level. This implies the need to regard education as a Centre-State partnership. On the other hand, it is necessary to remember that education which concerns every parent and every family has to be taken as close to the people as possible and that its administration can be best conducted by or in close association with local communities. This implies that educational planning has to be decentralized to the district level and still further down to the level of each institution. The process of educational planning in a federal democracy like ours has thus to be the right blend of centralization, in the appropriate sectors, with a large amount of decentralization in other sectors and especially in administration. Care should, however, be taken that the parts fall coherently into the totality of a broad national plan, and all discordant features and contradictions are eliminated. For this purpose, it will be necessary to devise an effective machinery of coordination. This is the direction in which administration has to strive and planning has to grow.

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[1] These are : teacher training, literacy among industrial workers and rural institutes.

[2] Chapter XII.

18.06. One useful suggestion which can be made in this context is to adopt a system of priorities at different levels—national, State and local. Programmes of national significance such as provision of good and effective primary education to every child, vocationalization of secondary education, post-graduate education and research, or education for agriculture and industry may be regarded as *national priorities* in the sense that the decisions regarding them would have to be taken by the Centre in consultation with the States and, once they are taken, it should be obligatory on every State to implement them effectively and vigorously. In several other matters, and these would form the bulk of the decisions to be made, a system of *State-level priorities* should be adopted, *i.e.*, each State may be left to make its own best decision in view of local conditions. These would include problems such as making secondary education free of tuition fees and in such matters, no attempt at a national uniformity need be made. In certain other matters, as for instance, in the provision of amenities in schools, and determining the type and scale of non-teacher costs, a system of *local priorities* may be adopted. The State Governments may create appropriate authorities at the district and school levels and leave them free to take decisions, within the powers delegated, and best suited to the local conditions. There should be no need to expect any uniformity in these matters between one district and another and even between one school and another. A system such as this which centralizes a few essential sectors at the national level would be much better than the present trend to take more and more decisions —crucial or otherwise—at the national and State levels. This sometimes results in the curbing of local initiative and disregard of local conditions.

18.07. **Redefinition of the Roles of the Different Agencies Providing Education.** It is also necessary to redefine the roles of the four different agencies which have been providing educational facilities in the country, *viz*., the Central Government, the State Governments, the local authorities and the voluntary organizations. Their present roles have arisen, not out of conscious planning, but from historical circumstances many of which have now ceased to have any relevance. For instance, the divorce of the Central Government from education which was so conspicuous a feature of our educational system from 1921 to 1947 arose out of a political necessity, *viz.*, the decision of the British Government to transfer education to Indian control (as a part of the system of Dyarchy introduced in the Provinces in 1921 and of Provincial Autonomy introduced in 1937) while retaining all authority at the Centre in the hands of the Governor-General. This tradition has been considerably modified by the Constitution and even more, by the developments in the first three plans, but it still dominates the scene. The local authorities were first placed in charge of primary education in British India as a part of a programme of transferring power to Indian people, and later on, they were permitted to develop other educational programmes in their discretion. In princely States, however, this political need did not exist and hence local authorities were not generally associated with education. The private educational institutions played an important role in all British Indian Provinces, especially in post-primary education, because direct governmental enterprise was limited and they had to meet almost all the growing demand for education. In the princely States. however, private enterprise was not much encouraged and sometimes it was even discouraged. It is obvious that these traditional roles are out of tune with the massive needs of educational development in the country and that they will have to be modified.

18.08. In the complex process of educational planning and implementation, the State Government occupy a central and key position. They have to accept, for instance, full responsibility for all school education, but it is advantageous for them to discharge it in collaboration with local authorities. The day-to-day administration of schools, which should be as close to the local communities as possible, may preferably be delegated, with adequate resources, to duly constituted local authorities at the district level. In higher education, on the other hand, they will have to share the responsibilities with the universities, the UGC and the Government of India. In other words,

- school education is predominantly a local-State partnership; and
- higher education is a Centre-State partnership.

In our opinion, it is this basic principle that should guide the evolution of that delicate balance between centralization and decentralization which our planning needs.

THE ROLE OF PRIVATE ENTERPRISE

18.09. **The Present Position.** We shall first discuss the role of private enterprise in education. This varies from area to area and also from one stage or sector of education to another. The following statistics of 1960-61, the latest available, throw light on this problem.

TABLE 18·1. PERCENTAGE OF NON-GOVERNMENTAL EDUCATIONAL INSTITUTIONS TO TOTAL NUMBER OF EDUCATIONAL INSTITUTIONS (1960-61)

State	Percentage
1. Andhra Pradesh	8·0
2. Assam	19·1
3. Bihar	74·0
4. Gujarat	36·0
5. Jammu & Kashmir	1·7
6. Kerala	61·6
7. Madhya Pradesh	4·6
8. Madras	33·0
9. Maharashtra	48·0
10. Mysore	34·3
11. Orissa	65·3
12. Punjab	7·4
13. Rajasthan	3·5
14. Uttar Pradesh	14·5
15. West Bengal	36·3
Total for India	33·2

Stage or Sector	Percentage
1. Pre-Primary	70·9
2. Lower Primary	22·2
3. Higher Primary	27·1
4. Seconday	69·2
5. Vocational Schools	57·4
6. Special Schools	79·0
7. Institutions for Higher (General) Education	78·8
8. Colleges for Professional Education	49·8
9. Colleges for Special Education	74·9
Total for all Sectors	33·2

Source. Ministry of Education, Form A.

The local authority institutions are not included.

18.10. It will be seen from the above table that the percentage of educational institutions managed by voluntary organizations is

- — low in Jammu & Kashmir (1.7), Rajasthan (3.5), Madhya Pradesh (4.6), Punjab (7.4), Andhra Pradesh (8.0) and Assam (19.1);
- — high in Kerala (61.6); Orissa (65.3); and Bihar (74.0);
- — low at the primary stage: lower primary (22.2) and higher primary (27.1);
- — medium in vocational schools (57.4) and colleges for professional education (49.8); and
- — high in pre-primary schools (70.9), secondary schools (69.2); special schools (79.0); institutions for higher (general) education (78.8); and colleges for special education (74.9).

With such large variations in traditions and in the present position, it is obvious that no single policy can be suitable for all parts of the country. In fact, even in the same State, the policy will have to vary from stage to stage, sector to sector and even from organization to organization. All that we can indicate, therefore, are a few general principles.

18.11. **Recommendations.** In our opinion, the future role of private enterprise in education should be broadly governed by the following principles:

(1) It is true that some forms of private enterprise have made a negative rather than a positive contribution to education. At the same time, we should recognize that private enterprise has played an important role in the development of education in modern India, that a large proportion of our good institutions are in the private sector and that it can continue to make a useful contribution to the development of education in the years ahead. The State should, therefore, make all possible use of the assistance that can come from the private sector for the development of education.

(2) The growing educational needs of a modernizing society can only be met by the State and it would be a mistake to show any over-dependence on private enterprise which is basically uncertain. As the State

has now rightly assumed full responsibility to provide all the needed educational facilities, private enterprise can only have a limited and minor role.

(3) Under the Constitution, private schools have a right to exist and if they do not seek aid or recognition from the State, there need be little or no interference with them. In fact, we have only suggested compulsory registration for unrecognized schools[1].

(4) The position with regard to private educational institutions which seek financial support from the State is, however, different. Even now, they depend upon Government for the larger part of their expenditure; and when fees, which is their main source of income, are abolished, their dependence on public revenues would be very large. These should, therefore, be gradually assimilated with the system of public education on the lines described earlier[2].

(5) In dealing with private enterprise, problems relating to their teachers, grant-in-aid and control are very important. These have already been discussed elsewhere[3].

THE ROLE OF LOCAL AUTHORITIES

18.12. **The Present Position.** As pointed out earlier, there are two historical traditions with regard to the role of local authorities—one of associating local authorities with education which grew up in the British Indian Provinces and the other of *not* associating them with it which grew up in the Indian princely States. The arguments for and against such association have been repeatedly stated and need only be mentioned here in brief. It is generally agreed that local authorities do succeed in evoking local interest and local enthusiasm and effectively bring local knowledge to bear on the solution of problems. Their financial contribution to the support of education is not large. But it is not negligible either; and it is substantial in the case of richer municipalities like Bombay City. Their main weaknesses, however, are the harassment caused to teachers, through frequent transfers and postings, and through involvement in local factions and politics. This is the one reason why almost all teachers' associations have represented to us that the local authorities should not be placed in charge of educational institutions. This evil increases as the delegation of authority goes to lower levels, *e.g.*, it is definitely greater when the authority is delegated to the block level than to the district level.

18.13. In the post-independence period, two attempts have been made to redefine the role of local authorities in education and to evolve a uniform national policy. Unfortunately, these have not succeeded, partly because the two Committees which examined the problem made somewhat conflicting recommendations. The Committee set up under the chairmanship of Shri B. G. Kher rejected the British Indian view that the creation of local authorities and their association with primary education was necessary as a training ground for democratic self-government. It was emphatically of the opinion that education should not be made a guinea-pig on the altar of democracy or decentralization and recommended that the interests of mass education should be the only criteria to decide whether authority over primary education should be delegated to the local bodies, and if so, to what extent. Although aware of the frequent maladministration of education by local bodies and particularly of the harassment which was often caused to teachers, it felt that these weaknesses could be overcome through appropriate measures and recommended that local bodies should be associated with the administration of primary education, with adequate safeguards to protect the interests of teachers, because 'such associations would further the cause of mass education and bring the goal of universal education near'[4].

18.14. Before the recommendations of the Kher Committee could be implemented or even adopted, a different set of recommendations on the subject was made by another Committee, *the COPP Team on Community Development*, which was set up under the chairmanship of the late Shri Balwantrai Mehta to review the community development programme and its future organization. It was of the view that local interest and local initiative in the field of development would not be adequately involved, unless 'a single, representative and vigorous democratic institution' was created at the appropriate level 'to take charge of all aspects of development work in the rural areas' and invested with adequate powers and appropriate finances. Such a body, said the Committee, 'must not be cramped by too much control by Government or Government agencies. It must have the power to make mistakes and to learn by making mistakes, but it must also receive guidance which will help it to avoid making mistakes' In accordance with this basic approach, the Committee recommended that strong local bodies should be created in rural areas and vested with adequate authority to administer all developmental programmes, including primary education.

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[1] Chapter X.

[2] Chapter X.

[3] Chapters III, IV, X and XIII.

[4] *Report of the Committee on the Relationship between State Governments and Local Bodies in the Administration of Primary Education*, 1951.

18.15. The problem of integrating these two different traditions and the divergent recommendations of these two Committees became urgent when the State reorganization brought together areas from the erstwhile British Indian Provinces and the princely States. But so far it has not been possible to solve it and to evolve a uniform national policy (or, in some cases, even a uniform State policy). The present position shows a mixture of both the traditions, not infrequently, even in the same State. In urban areas, the municipalities have been associated with education in Andhra Pradesh (Andhra area), Bihar, Gujarat (Bombay area), Madhya Pradesh (Maha Koshal area) Madras (Madras area), Maharashtra (Bombay and Vidarbha areas), Mysore[1] (Bombay and Madras areas) and Orissa (old Orissa province area). In the rural areas, the panchayati raj institutions have been introduced and placed in charge of education in all States except Jammu & Kashmir, Kerala, Madhya Pradesh, Mysore, Nagaland and Punjab. The method of association is also not uniform. The municipalities are generally in charge of primary education: but they can also undertake other educational activities at their discretion. The panchayati raj institutions have been entrusted with lower primary education in some States (*e.g.*, West Bengal); with the whole of primary education in some others (*e.g.*, Madras); and with both primary and secondary education in two States (Andhra Pradesh and Maharashtra). Authority over education has been delegated to the block level in some States (*e.g.*, Rajasthan and Madras); and to the district level in some others (Maharashtra). The systems of administration and grant-in-aid also show similar variations.

18.16. In our opinion, the policy in these matters will have to be decided on a pragmatic basis with reference to ultimate goals and local conditions. The close involvement of schools with their communities is a principle of great educational significance: and this is the direction in which we should move. At the same time, the difficulties caused to teachers under local authority management cannot be ignored and at least in the transitional stage, adequate safeguards would have to be provided to teachers. Local authorities should realize their responsibilities and ensure that they help rather than hinder the cause of education. Here we are more inclined to agree with the Kher Committee that the decision to associate local authorities with the administration of education should be taken not on political but on educational grounds and that the only justification for such a decision should be a conviction that it would promote the cause of education and bring the goal of providing universal education nearer. Similarly, local authorities should not be encouraged to think that they can claim to administer education as a matter of right and that this right will continue with them in spite of bad administration or harassment of teachers. The normal practice should be that a local authority is given the right to administer education as a privilege subject to two conditions—promoting the cause of education and good administration —and that this privilege would be withdrawn if either of these conditions is violated. There is no need to insist, as is often done at present, that a uniform policy must be adopted in all parts of the country simultaneously. It would be in the larger interests of education to adjust the experiment to local conditions and to permit each area to progress at a pace and in a manner best suited for its growth.

18.17. **Recommendations.** In view of these broad principles, we recommend that the future role of local bodies in education may be defined as follows :

(1) As an ultimate objective, it is essential that schools and their local communities should be intimately

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[1] The Mysore Government has recently decided to relieve the municipalities of this responsibility.

associated in the educational process. This will harness local knowledge, interest and enthusiasm for the development of education. Besides, local bodies can make a significant contribution to the total expenditure on education.

(2) It would, however, not be proper to look upon this democratic decentralization as an end in itself and to press for its universal and immediate adoption without reference to local conditions.

(3) The immediate goal in this respect —and this should be adopted immediately as a national policy in all the States—is to associate the local communities, namely village panchayats in rural areas and the municipalities in urban areas, with their local schools and to make them responsible for the provision of all non-teacher costs with the help, where necessary, of a suitable grant-in-aid from the States. The detailed proposals on this subject are discussed elsewhere[1].

(4) The ultimate goal to be reached is the establishment, at the district level, of a competent local education authority which may be designated as the District School Board (to be constituted under an Education Act which we are recommending) and which would be in charge of all education in the district below the university level. This should also be accepted as a national policy. The jurisdiction of this authority should cover the entire area of the district with one exception, namely, the big municipalities in the district with a population of 1,00,000 or more which should preferably have a similar authority for their own areas. The detailed proposals on this subject are discussed below.

(5) The transition from the immediate to the ultimate objective cannot be made in one jump but will have to proceed through a number of carefully planned stages. It cannot also be made simultaneously in all States and perhaps not even simultaneously in all the districts of a State. The difficult decisions regarding the type of local authority to be created, th elevel at which powers are to be delegated, the extent and nature of delegation, the powers to be retained by the State Government, the system of grant-in-aid, etc., are so complex that each State will have to decide them for itself, not even necessarily for the State as a whole, but perhaps separately for each district. While, therefore, the Centre may advise the States to move towards the ultimate objective as soon as practicable, it would be wrong to pressurize all States to adopt common policies in the matter. There is no inherent virtue in such a uniformity; and it may lead to better administration to recognize that, while the immediate and ultimate objectives may be assumed as national goals, there need be no uniformity with regard to the details of the transition from the immediate to the ultimate objective. These should be left for decision at the State level in view of local conditions.

(6) In all such association of the local authorities with education, adequate safeguards should be provided to ensure that the teachers are not harassed and that they do not get involved in local factions and politics. Experience has shown that, for this purpose, it is necessary to vest the control over the teachers, not in the local authority, but in its Administrative Officer (who should be an officer of the Education Department seconded to serve under the local authority), to associate him closely with the District Education Officer in the discharge of this responsibility and to frame a fairly detailed system of rules and regulations to smoothen and guide the day-to-day administration.

(7) It is necessary to remember that it is not enough to decentralise the administration of education and to vest it in the local authority. The programme will not succeed unless intensive steps are taken, to

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[1] Chapter X.

educate local leadership on the right lines, to provide the local authority with trained and competent officers who would have certain independence in the performance of their duties and to make the necessary resources available to the local authority to fulfil the responsibilities placed upon it. This will be a major task for the State Education Departments.

18.18. **The District and Municipal School Boards.** The need for the establishment of local educational authorities at the district level has been pointed out already[1]. We shall now discuss some details about their composition, powers and responsibilities and finances. The jurisdiction of the district school board should cover the entire area of the district with one exception, namely, the big municipalities in the district with a population of about 100,000 or more which should preferably have similar boards for their own areas. A district school board should consist of—

(1) Representatives of the Zila Parishad elected by itself;

(2) Representatives of the municipalities in the district (which do not have a separate school board of their own) elected in the prescribed manner;

(3) Educationists nominated by the State Government or elected by the Zila Parishad from out of the panel approved by the State Governments; and

(4) *Ex-officio* members, such as officers of education, agriculture, industries or other departments which administer vocational schools.

Persons in categories (3) and (4) should be about half of the total membership. A *senior officer of the State Government* (Class I) should be the whole-time secretary of this board, which should be provided with the necessary administrative and supervisory staff.[2]

18.19. The functions of this board would cover all school education in the district—general as well as vocational: it will directly administerater all government and local authority schools within the district, and it will also remain in charge of giving grants-in-aid to all private institutions in the district in accordance with the rules framed by the State Government for the purpose.

18.20. Within the framework of the instructions given by the State Government, it should be a responsibility of the district school board to prepare plans for the development of school education within the district and it should also be the principal agency within the district to develop school education, the finances and guidance required for the purpose being provided by the State Government and the State Education Departments.

18.21. In big towns with a population of 100,000 or more, it would be desirable to establish municipal school boards on the above lines, since these would be viable administrative units. It would also give an opportunity to the local people, who are better educated, more well-to-do and vocal, to take positive interest in developing an educational programme for their children. The composition, powers and responsibilities of these boards should be similar to those of the district school boards.

18.22. Each school board will maintain an education fund. The Zila Parishads (or municipalities) will approve the budget of the school boards. They will also raise the resources expected of them and credit them to the school board. In all day-to-day administration, the school board would be autonomous. The same relation would hold good between a municipal school board and its municipality.

18.23. The recruitment of teachers will be done by a special committee consisting of the chairman of the board, its secretary and the district education officer. The transfers should be effected by the same committee, subject to rules framed by the State Government, the general policy being to reduce transfers to the minimum and to allow teachers to develop loyalties to individual institutions. The salaries, allowances, and service conditions of teachers will be regulated by the State Governments and will be common to all the districts. These measures will provide safeguards to teachers;

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[1] Chapters VI and X.

[2] Where Zila Parishads do not exist, the composition of the District School Boards will have to be decided differently to suit local conditions. It may consist of persons nominated by the State Governments and others representing local interests.

and the fact that all school teachers are serving together under the boards (and not primary teachers alone as at present) will be a further strength and an additional safeguard.

18.24. It may be advantageous, in some cases, not to burden the school boards with full administrative responsibilities all at once. In such cases, the entire administration of the schools may be left with the officers of the Department (especially the personnel administration) and the school board may be given powers with regard to planning and development. Additional powers may be conferred on it as it gains experience and competence.

THE ROLE OF THE CENTRAL GOVERNMENT

18.25. **The Present Position.** Under the Constitution, the Central Government has been specifically vested with several educational responsibilities, and certain other responsibilities also devolve upon it as the Government of the Union. The more important of these are enumerated in the following entries of the Seventh Schedule.

List I—Union List

63. The institutions known at the commencement of this Constitution as the Banaras Hindu University, the Aligarh Muslim University and the Delhi University, and any other institution declared by Parliament by law to be an institution of national importance.

64. Institutions for scientific or technical education financed by the Government of India wholly or in part and declared by Parliament by law to be institutions of national importance.

65. Union agencies and institutions for :

(1) professional, vocational or technical training, including the training of police officers; or

(2) the promotion of special studies or research; or

(3) scientific or technical assistance in the investigation or detection of crime.

66. Co-ordination and determination of standards, in institutions for higher education or research and scientific and technical institutions.

List III—Concurrent List

25. Vocational and technical training of labour.

In addition, the Government of India is also responsible for several other educational programmes which include: national planning; educational and cultural relations with other countries; participation in the work of the UN and its specialized agencies, especially UNESCO; clearing-house function of collecting and disseminating ideas and information; education in the union territories; propagation, development and enrichment of Hindi; preservation and promotion of national culture, including patronage to national art; special responsibilities for the cultural interests of minorities; responsibilities for the weaker sections of the people such as the scheduled castes and scheduled tribes; responsibility for promoting national integration through suitable programmes; and grant of scholarships, particularly at the university stage.

18.26. **Recommendations.** We are of the view that education must increasingly become a national concern and we have indicated, in the relevant context, the role that the Government of India should play in the development of education. For instance, apart from its role in the improvement of educational administration which we are discussing in this chapter, we have indicated several other central responsibilities in education for

— the improvement of teacher status and teacher education,[1]

— manpower planning in crucial sectors like agriculture, engineering, medicine, etc.,[2]

— the development of a programme of scholarships,[3]

— the equalization of educational opportunities with special reference to the reduction of inter-State differences and the advancement of the weaker sections of the community,[4]

— the provision of free and compulsory education as directed by the Constitution,[5]

— the vocationalization of secondary education,[6]

— the improvement of standards at the education,[7]

— the development of higher education and research with special reference to the postgraduate stage,[8]

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[1] Chapters III and IV.
[2] Chapter V.
[3] Chapter VI.
[4] *Ibid.*
[5] Chapter VII.
[6] *Ibid.*
[7] Chapter X.
[8] Chapter XII.

— the development of professional education in agriculture and industry,[1]

— the promotion of scientific research,[2] and

— the promotion of educational research.[3]

18.27. We are convinced that the radical reconstruction of education which we have recommended in this Report will not be possible unless (1) the Government of India provides the needed initiative, leadership and financial support, and (2) educational administration, both at the Central and State levels, is adequately strengthened.

(1) With regard to the first, we recommend that the Centre should play an important role in the development of educational research. It should make the good work done in one area of the country known to the other areas, through the coordinating and clearing-house functions which cross-fertilize educational thinking, through periodical reviews and through conducting, or offering assistance to conduct, pilot or experimental projects. There is also the need to establish, in special cases, Central institutions which can set the pace for others. It is but proper that, as in the past, the Central institutions thus established should largely be in the scientific and technical sector. But it is also necessary for the Centre to establish institutions specializing in social sciences, including pedagogical sciences and the humanities. These should be established in close association with the universities and be an integral part of the university system. Besides, the Centre can also develop education in the Union Territories, particularly in Delhi, to serve as a pace-setter for the other areas.

(2) As regards the general strengthening of the administration, the constitution of the Indian Educational Service, with the amendments proposed by us, is a step of considerable importance. It is also a Central responsibility to arrange for the in-service training of educational administrators through such programmes as the conduct of an administrative staff college for senior officers of State Educational Services. This will be discussed in some detail a little later. The Centre should scout for talent in different fields and make the services of the best people in the country available to the State Governments for advice and assistance in all matters. It also has a significant role in the preparation of teachers to which we have already made a reference.

18.28. Equally important is the role of the Central Government in providing financial assistance for the development of education. This assistance will take three forms:

(1) Grants-in-aid (including transfer of revenues) made to the State Governments on account of their committed expenditure, through the quinquennial Finance Commissions,

(2) Grants-in-aid for development expenditure given for the plan as a whole, through the Planning Commission; and

(3) Expansion of the Central and the Centrally-sponsored sectors.

With regard to the first, our colleague, Prof. M. V. Mathur, is of the view that it would be a great improvement if the Finance Commission could be a Standing Commission, mostly with part-time membership and a small, compact secretariat. Certain minimum percentages of the proceeds of income-tax and Central excise revenues could be guaranteed to the States and distributed on population basis. For the rest of the flow of funds from the Centre to the States, the Finance Commission should hold annual reviews (this could be done immediately after the annual plan discussions with the States) and make necessary adjustments in transfer of revenues and grants-in-aid on the basis of needs and performance.

With regard to the second, we are not generally in favour of earmarking funds for specific sub-schemes in the educational sector within the State plans. The total allocation for education should not be altered without the approval of the Planning Commission. But within it, the State Governments should be free to use the funds at their discretion.

We attach considerable importance to the third, namely, the expansion of the Central and the Centrally-sponsored sectors. It is through this mechanism that the Centre will be able to stimulate and guide educational developments in the national interests in the crucial sectors referred to above

18.29. **Should Education be in the Concurrent List?** An important issue raised in regard to the role of the Central Governmen is the desirability or otherwise of including education in the concurrent list in the Seventh Schedule of the Constitution so that the Centre may be able to control educational developments through legislation. The Committee of the Members of Parliament on Higher Education (presided over by Shri P. N. Sapru) which examined the whole issue recommended that higher education at least should be included in the concurrent list. In the same vein, we have received various proposals to include some other sectors of education, *e.g.*, technical education, in the concurrent list. Our colleagues, Shri P. N. Kirpal and Dr. V. S. Jha are of the view that the whole of education should be included in the concurrent list. In their opinion, the experience of the years since independence has shown that, for the lack of adequate authority at the Centre, national policies could not be implemented satisfactorily and that the excellent recommendations of many commissions and committees, in various fields of education, remained on paper. Even the resolutions unanimously adopted by the conferences of Education Ministers and the Central Advisory Board of Education remained unimplemented. They think that although there is some scope for more effective implementation within the present constitutional set-up by evolving suitable conventions and especially by developing new attitudes to the national character of education, these changes will not be easy to be brought about and they will not be sufficient. They, therefore, think that the Union Government should be invested with legal authority in the field of education, which should appear in the concurrent list of subjects. The constitutional amendment will, of course, take some time to take effect; but the process towards this should be started as early as possible.

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[1] Chapters XIV and XV.

[2] Chapter XVI.

[3] Chapter XII.

18.30. We have examined this problem very carefully. We are not in favour of fragmenting education and putting one part in the concurrent and the other in the State list—education should, under any circumstances, be treated as a whole. We also do not agree with our colleagues and are of the view that in a vast country like ours, the position given to education in the Constitution is probably the best because it provides for a Central leadership of a stimulating but non-coercive character. The inclusion of education in the concurrent list may lead to undesirable centralization and greater rigidity in a situation where the greatest need is for elasticity and freedom to experiment. We are convinced that there is plenty of scope, within the present constitutional arrangement to evolve a workable Centre-State partnership in education and that this has not yet been exploited to the full. The case for amending the Constitution can be made only after this scope is fully utilized and found to be inadequate. All things considered, we recommend that an intensive effort be made to exploit fully the existing provisions of the Constitution for the development of education and evolution of a national educational policy. The problem may then be reviewed again after, say, ten years

EDUCATIONAL ADMINISTRATION AT THE NATIONAL LEVEL

18.31. The agencies at the national level concerned with the development of education are the Ministry of Education, the University Grants Commission and the National Council of Educational Research and Training (or the NCERT). We have already discussed the role of the UGC[1]. We have also suggested the establishment of a National Board of School Education[2]. We shall now turn to our proposals for the Ministry of Education and the NCERT.

18.32. **Ministry of Education.** The present convention is that the post of the Secretary to the Government of India is *not* to be filled from the ICS or IAS pool and that it should be given to an eminent educationist who should be designated as 'Educational Adviser to the Government of India and Secretary to the Ministry of Education'. This is a healthy tradition and should continue. It is also necessary to make it clear that this is a 'selection post' and that it should not go, as a matter of routine, by promotion to the present advisory service or even to the proposed IES. This should be a tenure post, given only for six years in the first instance with an extension, in exceptional cases, for three or four years, but not renewable further. The selection should be made from amongst all persons available, official, non-official, IES, university men, etc. So much depends upon the selection of the right man for this post that no vested interest of any service should be allowed to stand in the way and, through a proper machinery for selection, the best man available in the country should be recruited on a tenure basis. We would like to mention that the present status of the Ministry of Education in the academic world is largely due to the fact that its Secretaries were selected in the post-independence period from outside the services and from among eminent educationists.

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[1] Chapter XIII.
[2] Chapter X.

18.33. It is extremely important that eminent educationists, outstanding teachers in universities and schools and leading officials from the State Education Departments should be associated with the Ministry of Education so that it can provide the needed leadership and command the confidence of the public and the teaching community. We, therefore, recommend that all the posts at the level of additional or joint secretaries and joint educational advisers should be divided into two categories:

(1) About half the posts should be filled from among the official ranks by promotion, *i.e.*, from the present education advisory service (or the IES when it is constituted) and officers seconded from the State Education Departments.

(2) The remaining half should be filled from the ranks of eminent educationists and outstanding teachers in universities and schools. The term of each tenure should be five years to be renewable at the most for a second term.

The top level machinery for advising the Union Minister of Education and executing his orders will consist of the Educational Adviser and Secretary to the Government of India and all the additional and joint secretaries and joint educational advisers.

18.34. Our proposals to strengthen evaluation and research by the establishment of a Research Council in the Ministry of Education has already been discussed in Chapter XII and earlier in this chapter. Two other functions of the Ministry of Education also need considerable strengthening and expansion.

(1) The first is the clearing-house function. The Ministry of Education has to function as a national clearing house in education. This is necessary, not only in its own right, but also as an important aid to planning. What is needed is the collection of information on important educational topics from the State Governments, according to a well-planned schedule and its publication, with proper analysis, for the information of all concerned. These data should also be re-collected periodically so that each publication serves as a bench-mark. We recommend that a well-staffed division should be created to perform this function on an adequate scale. It was not possible for us to go into the details of the various types of studies required. Some of these have been indicated in our Report in the appropriate context. We suggest that the Ministry of Education may set up a committee to examine the issue and to prepare a programme for action.

(2) The second is the maintenance of a good statistical service which is another major responsibility of the Ministry of Education, from the point of view of educational planning, policy-making and evaluation. This service should have three main functions: (a) to collect, publish and interpret educational data; (b) to conduct statistical studies, investigations and surveys; and (c) to make projections and forecasts for the future. The existing statistical service leaves a good deal to be desired. At present, only the first function is being performed. There is so much delay in the collection, collation and publication of the data that it is almost out-of-date for the purpose of planning by the time it is published. Moreover, no worthwhile interpretation of the past data is done and the other two functions have been completely ignored. In order that these functions may be discharged properly, it is essential that the statistical section of the Ministry should be reorganized and strengthened. From this point of view, we make the following recommendations:

(a) A master plan should be prepared for the publication of educational data and for the surveys and investigations which should be conducted from time to time.

(b) The combination of the publication of routine statistics with studies of special problems is not desirable. The publication of routine annual statistics should therefore be the responsibility of a special unit as at present. But it will be desirabl to create a new unit for the conduct of special surveys and investigations.

(c) To make this service more efficient, it will be desirable to introduce mechanization to the extent feasible.

(d) The statistical unit should continue its present function of providing training to the statistical staff of the State Governments and universities. However, there is need to tone up the quality and content of this training. The Ministry should also provide opportunities to its own statistical staff to receive training and periodic reorientation at training courses conducted by other expert bodies like the Indian Statistical Institute and the Central Statistical Organization.

(e) The statistical units of the State Departments of Education will have to be reorganized and strengthened likewise to enable them to perform practically the same functions as outlined above for the statistical unit of the Education Ministry.

18.35. Of the various advisory bodies of the Ministry of Education, the most important is the Central Advisory Board of Education which has been functioning since 1935. The Minister for Education, Government of India, is the chairman of this Board and all the State Ministers of Education are members. The Government of India also nominates a few experts and representatives of different interests on the Board. It has also the representatives of the Planning Commission, the University Grants Commission and the Inter-University Board of India. We recommend that this organization with all its standing committees be functionally strengthened.

18.36. **NCERT.** The establishment of the National Council of Educational Research and Training has been a step in the right direction. We give below some indications of the lines on which its future development should take place.

(1) *Functions.* The principal function of the NCERT is extension work with the State Education Departments centering round the improvement of school education. It is uniquely suited for this function because the Union Minister for Education is its President and all State Education Ministers are its members. The objective of policy should, therefore, be to develop the NCERT as the principal technical agency functioning at the national level for the improvement of school education and operating through and in collaboration with the National Boards of School Education, State Departments of Education and their technical agencies like the State Institutes of Education.

(2) *Constitution.* The Governing Body of the NCERT should have an All-India character, with a majority of non-officials. In particular, it is desirable to have at least one outstanding teacher from secondary schools and a person specializing in primary education, preferably a primary teacher.

(3) *Director and Joint Director.* We recommend that the Council should have its own full-time Director and Joint Director. At present, the Secretary to the Ministry of Education is the Director of the Council and an officer of the Ministry (generally part-time) is the Joint Director. This is not an ideal arrangement, and the size and importance of the Council are such that it would be wrong to leave its leadership in the hands of part-time officers whose loyalties and commitments lie elsewhere. The Council should have a whole-time Director of its own who should be an eminent educationist in the field. His status should be that of a vice-chancellor. His term of office should be five years, renewable for not more than one term. The Joint Director (who may be an officer lent by the Ministry) would be needed mainly for the purposes of assisting the Director and relieving him of routine administrative matters.

(4) *Regional Colleges and CIE.* The NCERT is now running four regional colleges for training of secondary school teachers. Our views on this programme have been fully discussed elsewhere[1]. The Council is also in charge of the Central Institute of Education, Delhi. We suggest that this institution should be transferred to the Delhi University; and we hope that the Delhi University will establish a School of Education on the lines of our recommendations and give a lead to the improvement of the programme of teacher education in the country.

(5) *Personnel.* The success of the NCERT will depend upon the extent to which it is accepted by the State Education Departments and their technical wings and upon the extent to which it is able to assist them

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[1] Chapter IV.

to solve their technical problems in the field. It would, therefore, be desirable that there is a considerable interchange and flow of officers from the NCERT to the State Departments and *vice-versa*. This could be secured by inviting selected officers from the State Education Departments to work in the NCERT on tenure appointments. Arrangements should also be made with the State Governments under which officers of the NCERT could work in State Education Departments for specified periods.

(6) As the NCERT has to play the key-role in promoting qualitative improvements in school education, it is imperative that its campus should be developed speedily and the building programme given the highest priority. The present dispersal of departments and units in distant parts of the city is not conducive to efficient functioning.

EDUCATIONAL ADMINISTRATION AT THE STATE LEVEL

18.37. The State Education Departments are the principal agency to prepare and implement educational plans. Unfortunately no adequate attention has been paid so far to their development on proper lines. Their structure, designed during the British period for very limited purposes, continues to be substantially unchanged even to this date. Their procedures and programmes are still largely traditional and the outlook of their officers is, more often than not, rigid and conservative. It is true that there has been some expansion in the Education Departments. But most of this expansion has been on traditional lines and has not implied any qualitative change in their functioning. Moreover, even this numerical expansion has not kept pace with the demands of the situation and has fallen far short of the expansion in the number of educational institutions, their enrolments, or total educational expenditure. In some States, programmes of retrenchment in the strength of the Education Departments have been carried out even when expansion of educational facilities was in full swing. The State Education Departments, as constituted at present, will not be in a position to assume responsibility for the complex and difficult programme of educational reconstruction outlined in this Report. It is, therefore, necessary to accord priority to programmes for the improvement of educational administration at the State level. Our major recommendations in this regard are given below.

18.38. **Coordination.** Coordination is very often an administrative bottleneck at the State level because educational programmes are spread over a number of departments at present. In most States, general education is in one department and under one Director of Education or Public Instruction. In some States, however, even general education is divided into two parts—college education and school education, and placed under different Directors. Sometimes there are additional directorates for Sanskrit or art education. In three States the education of tribals is separated and placed under a different department. In all States, technical education is under a separate directorate and may or may not form a part of the Education Department. Agricultural education is generally under the Department of Agriculture and medical education under the Medical and Health Services Departments. The industrial training institutes are mostly under the Department of Industries. Programmes of adult education are sometimes grouped with general education and, on other occasions, placed under the Community Development Administration. It is obviously necessary that these different programmes of educational development should be coordinated properly and viewed as parts of a comprehensive whole.

18.39. To place all these different aspects of education under the 'umbrella' of a single department does not seem to be administratively feasible, and, for some time to come, we shall have to accept the factual position that education will be administered by more than one department. It is, therefore, desirable to create, at the State level, some machinery to coordinate the programmes of all these different sectors of education and to take a unified view for purposes of planning and development. The following two measures may be considered from this point of view:

(1) A statutory *Council of Education* should be created at the State level. As separate arrangements have already been suggested for the development of higher education which is a Centre-State-University partnership, the scope of this Council should be restricted to school education or all education below the university level. It should have the State Minister for Education as the chairman and its membership should include representatives of universities in the State, all directors in charge of different sectors of education and some eminent educationists. It should meet about

three or four times a year and have a small secretariat of its own. Its principal functions should be to advise the State Government on all matters relating to school education, either *suo motto* or on points referred to it, to review educational developments in the State and to conduct evaluation of programmes from time to time through suitable agencies. This should be the most important advisory body at the State level and if necessary, it may form standing or sub-committees for different sectors and programmes. Its annual report, along with its recommendations, should be presented to the State legislature.

(2) It may be desirable to have, in addition, a standing committee at the officers level. It would include all State level officers in charge of different sectors of education and meet periodically under the chairmanship of the Education Secretary.

18.40. **The Education Secretariat.** At present the Education Secretary is generally an IAS officer, except in West Bengal, where he belongs to the Education Service. We are of the opinion that the Education Secretary also, like the Educational Adviser to the Government of India, should be an educationist rather than an administrative officer. It will, therefore, be desirable to make this appointment a tenure post.

18.41. The relationship between the Education Secretary and the Director of Education has been a subject of long controversy since the issue was first highlighted by the Hartog Committee in 1928. The most common complaint is that the Education Secretariat completely dominates over the Directorate of Education and interferes even in purely technical matters. It has also been argued that the dual scrutiny of proposals that now takes place in the Directorate as well as in the Education Secretariat leads to considerable delays. The remedy most frequently suggested is that the Director of Education should be *ex-officio* Secretary or Additional Secretary to the Government. The problem is difficult and there is no easy answer to all the complex relationship. Broadly speaking, the role of the Education Secretariat should be to examine educational problems from the administrative and financial points of view and in the wider context of government policies for development. It should give due weightage to the views of the Directorate in technical matters and assist the Director to function as the effective head of his department. The key to a successful relationship lies, however, in the 'personal equation' between the Director of Education and the Education Secretary; and where this has been of the right type, the results have been satisfactory.

18.42. **Directorate of Education.** At present the Directorates have grown big and there is not enough delegation of powers to the district level. The time of the Director of Education therefore, is so taken up with personnel administration and trivial details that he has no time for his principal responsibility of providing leadership in educational development. We have, therefore, made two important proposals which will alter the entire functioning of the department:

(1) the constitution of district school boards at the district level and the transfer to them of the administration of all education below the university level (including the management of all government schools); and

(2) the strengthening of the office of the district inspector of schools so that he takes over almost all the responsibilities of the Directorate in his area.[1]

When these changes are carried out, the directorate will be a compact and efficient organization concerned mainly with general coordination and supervision over the district education officers and district school boards. It will then be possible for them to vitalize education through a purposeful and dynamic leadership.

PERSONNEL

18.43. Administration is essentially a matter of faith and vision, bold and courageous leadership, and proper handling of human relations. The importance of securing the right type of personnel for it cannot, therefore, be over-emphasized. The major weaknesses of the existing organization of the State Education Departments are largely related to personnel. These include: shortage of personnel at the higher level: lack of specialized staff: unsatisfactory remuneration and conditions of service; unsatisfactory methods of recruitment; inadequate provision of in-service education; and inadequate staffing.

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[1] Chapter X.

18.44. **The Indian Educational Service.** The creation of the Indian Educational Service or IES is a step in the right direction and if organized on proper lines, such a service would help the progress of education. We are, however, not happy at some of the features of the proposal which is now under the consideration of Government. We shall, therefore, examine this issue in some detail.

18.45. At the very outset, it should be noted that the character of the IES will have to be very different from the IAS or other Central Services. First, in education, administration is a service agency to teaching and research and not their master. Secondly, one cannot be a good educational administrator unless one *is* also a good teacher. Thirdly, there should always be a possibility for an educational administrator to come back to teaching or research and for a teacher to go over to the administrative side on a tenure assignment. In our opinion, the present proposal for the organization of the IES cuts across these sound principles of educational administration. As proposed at present, two-thirds of the recruitment to the IES will have to be made directly by open competition. The persons selected will not generally have any experience of teaching or research and would have had no opportunity to show their competence in these fields. The remaining one-third of the posts will be filled by promotion from State services and some of these may be teachers in government schools and colleges. But the bulk of the teachers, *i.e.*, all university teachers and teachers in private schools and colleges will be barred entry within its ranks. This can only have a depressing effect upon the body of the teaching profession and ultimately on education itself. We, therefore, strongly feel that the method of recruitment to the IES should be as follows:

(1) Only one-third of the posts should be filled by direct recruitment at the level of the junior scale. Even these selected persons should not be placed in administration direct. Their first assignments, for a minimum period of 2 or 3 years, should be in teaching; and it is only after this initiation that they should be assigned to administration.

(2) The remaining two-thirds of the posts should be filled, partly by direct recruitment and partly by promotion at the level of the senior and higher scales. One-half of these posts (*i.e.*, one-third of the total) would be filled by promotion from the State services. The remaining half should again be filled by direct recruitment—some at the level of the senior scale and others at the level of the higher scales. The age limits for these recruitments should be suitably fixed, say, 35 and 45 years, and the applicants should have put in a minimum of service as teachers or should have distinguished themselves as research workers.

(3) Some posts in the IES should be available for being filled by tenure appointments of teachers for specified periods. In the same way, some posts in teaching and research should also be available for tenure appointments of persons from the IES.

18.46. The second point which we examined in detail was that of creating a teaching wing in the IES. The present proposal visualizes the encadrement of the posts of the principals of Government colleges (which are regarded more as administrative than as teaching posts). There is also a suggestion that some posts of the principals of higher secondary schools should be encadred. There is no objection to a few posts of principals of Government colleges or of higher secondary schools being encadred. In fact, it would be good to do so. But this does not require the creation of a teaching wing—the posts of these principals can be made inter-changeable, as they are even at present, with some levels of inspecting officers. But there are insuperable difficulties in the creation of a teaching wing as such which, if it is to be created at all, should include a large proportion of the teaching posts in higher education. This will not be possible because all the teaching posts in the universities and the vast bulk of the posts in the government colleges (to say nothing of the posts in private affiliated colleges) will have to be kept out of the IES. The attempt to create a teaching wing by the encadrement of a few posts of the principals of government colleges is, therefore, likely to do more harm than good by adversely affecting the morale of the teaching community as a whole. We, therefore, recommend that the idea of creating a teaching wing in the IES should be abandoned and the service should encadre only the following posts:

- All posts of Directors, Additional Directors, Joint Directors, Deputy Directors, etc., District Educational Officers (and equivalent posts) in the State Education Departments (inclusive of the principals of government colleges and a few posts of headmasters of higher secondary schools);
- All gazetted advisory posts in the Ministry of Education;
- suitable posts in the NCERT;
- all gazetted posts dealing with educational programmes in other Ministries of the Government of India;
- suitable gazetted posts in the Education Departments of the Union Territories; and
- suitable posts of principals of higher secondary schools under the scheme of Central Schools.

18.47. Instead of creating a teaching wing in the IES, we recommend that an adequate number of posts comparable to the higher scales of pay in the IES should be created in the universities and colleges. This is justified on educational grounds because the remuneration and status given to teachers and research workers should be at least equal, if not better, than those given to educational administrators. It will also prevent a drain of talent from teaching and research to administration.

18.48. Some thought will have to be given to languages required from the members of the IES. It is true that officers of the IES will need a much better command over the regional language than those in the IAS. But the advantages of the service would be lost to a considerable extent if every member of the IES is recruited and assigned only to the State to which he belongs. It should be a convention that only about 50 per cent of the IES officers are assigned to their own States; and there should also be the possibility of inter-State transfers (in addition to deputation to the Centre). Hence each member of the IES should be required to study and pass, within a given time after recruitment, tests in two other languages (Hindi and one modern Indian language which is not his mother-tongue) at certain prescribed levels.

18.49. The changes we have recommended in the organization of the IES and the corresponding improvement in the remuneration of teachers and research workers are extremely significant. If these are carried out, the IES will strengthen the administration without adversely affecting teaching or research.

18.50. **The State Educational Services.** At present, the State Educational Services are divided into three broad groups—Class I, Class II and others. In the reorganization of these services, the following points will have to be kept in view:

(1) There should be an adequate number of posts at higher levels, namely in Class I and Class II. The secretaries of the district school boards should be in Class I. The District Educational Inspectors (who will be in the IES) should have adequate assistance from officers of Class I and Class II status.

(2) The methods of recruitment would have to be improved. A disturbing trend now seen is to push fresh recruitment to all posts on the administrative side of the State Education Departments lower and lower down the line. In one State, all fresh recruitment to all the departmental posts is done at the assistant masters' level. In such cases, a young talented graduate from the universities is not attracted to the service and all higher posts come to be gradually occupied by those who have risen from the ranks. What is needed is recruitment at three levels: assistant teachers' level; Class II level (50 per cent for freshers and 50 per cent for promotion); and Class I level (75 per cent for freshers and 25 per cent for promotion). There should be, as in the IES, suitable relaxation in age limit while recruiting at higher levels.

(3) In the pre-independence period, the main functions of the department were two: the control of educational institutions—public and private—and distribution of grant-in-aid. The entire cadre of the department consisted, therefore, of 'generalists' *i.e.*, persons who had some initiation into education (as indicated by the B.T. or a similar degree) or had some experience of teaching. There were

a few special posts (*e.g.*, Inspector of Audio-Visual Education), no doubt; but there was no special training for the purpose and anyone could be appointed to the post and expected to learn his job by doing. Even inspections were 'general' in the sense that an officer who inspected the school was expected to guide the teaching of all subjects and look after all aspects of the school life. By and large this tradition has continued to this day. But it has outlived its utility. With the enlargement of the functions of the Education Departments and the heavy responsibilities it has now come to assume for the improvement of education, the need for specialized officers has increased. For instance, curricular reform has assumed great significance; and yet there is not one specialist in curriculum in all the State Education Departments. Similar observations could also be made about other fields of education such as evaluation, textbooks, etc. One of the major reforms now needed is to reorganize the State Education Departments where necessary, on the basis of specialized functionaries (the need for whom is universally recognized) and, what is even more urgent and important, to make adequate arrangements for their specialized training with the help of the universities. These specialist officers (who will include subject inspectors) will be appointed at two levels —at the directorate and on the district staff.

(4) There are several anomalies in the salaries of departmental staff in the States and Union Territories. Two of these deserve notice:

(1) Should the scales of pay in the administrative wing of the Education Department be the same as in its teaching wing or should they be different? At present, three practices are in vogue. In some States, they are identical: in some, the scales of pay on the teaching side are kept higher while in others, it is the other way round. The ideal position would be to keep the scales of pay identical but to add allowances, either to the teaching or to the administrative side, to make up for the inconveniences, losses or disadvantages, such allowances being payable only so long as the person occupies the post. Such a system would make for easier transferability between the two wings and promote traffic both ways.

(2) The scales of pay of the departmental staff (Class I and II) are made comparable, not with the UGC scales of pay, but with those of similar posts in other departments. This creates difficulties for the transfer of persons from the teaching to the administrative wing. We would recommend that the scales of pay of the departmental staff should be correlated with the UGC scales of pay for university teachers.

18.51. **Training of Educational Administrators.** The existing facilities and arrangements for the training of educational administrators are inadequate. Pre-service education for administrators is neither necessary nor possible. It is true that educational administration is one of the subjects taught on an optional basis in the courses of the M.Ed. degree in some training colleges and university departments of education. The number of places available in these courses is very limited. Their standard leaves a good deal to be desired because they are taught by persons who themselves have little experience of administration, because the literature available on Indian conditions and practices is very limited and because there are hardly any facilities for giving practical training to the students. Such pre-service education can only be of limited use and one has largely to rely on in-service education for the training of educational administrators.

18.52. Unfortunately there is little or no provision for such training opportunities at present in any State Education Department. This is all the more surprising because the efficacy of training is the basic assumption in education. Training for an educational administrator is needed, not only because the tasks he is required to perform are difficult and complex, but mainly because it is necessary to orient him to the programme of educational expansion and improvement which has to be implemented in the next two decades and to the role which educational administration should play therein. From this point of view, we make the following recommendations:

(1) At the non-gazetted level, the number of officers is very large and arrangements for their in-service training would necessarily have to be made at the State level. We recommend that the State Institutes of Education, in collaboration with the universities, where necessary, should organize the in-service education programmes of all the non-gazetted educational staff on the administrative and inspectional side. The objective should be to provide an in-service training of about two months to every officer in every five years of his service. In addition, they should also organize conferences, seminars, and workshops for the gazetted staff.

(2) At the level of the gazetted officers, the numbers in any given State are not large enough for developing a training institution at the State level. We, therefore, recommend that the Ministry of Education should run a National Staff College for senior educational administrators of the State Departments of Education.

(3) The task of an educational administrator is generally so heavy that he gets no time to read and to keep himself abreast of educational thought. The programmes of in-service education recommended above will correct this weakness to a great extent. In addition, it will be desirable to revive the old practice of giving three months leave on full pay for every five years of service, for undertaking special studies in educational problems. Preferably still, the idea of a sabbatical year of leave should be extended to senior posts in administration. He should also have the option to add to this his unutilized privilege leave (which now more or less lapses), if he desires. The only condition attached to this leave should be that the officer should submit a report on his studies at the end of the leave period.

(4) Some incentives should be provided for the officers who improve their qualifications materially through programmes of in-service education.

18.53. **National Staff College for Educational Administrators.** We attach importance to the establishment of the National Staff College for Educational Administrators and would like to indicate broadly the manner in which it should function.

(1) The object of the college should be to provide in-service education, for about eight weeks, in every five years of service, to all the senior officers in the education service—IES and State Educational Services (Class I and Class II).

(2) It should have a permanent and whole-time staff of its own. In addition, it should use, as resource personnel, senior officers of the Education Departments and the Ministry of Education. As educational administration cannot function in isolation, competent persons from other departments also should be utilized for purposes of training. This will incidentally serve an important objective of such training, namely, to bring the young recruits to the cadre in living contact with senior officers.

(3) It should have a research wing where studies would be conducted in problems of educational administration. It should maintain a good library of books on the subject, both Indian and foreign. Besides, it should also function as a clearing-house of administrative procedures and practices in the States and Union Territories.

(4) As very little material on Indian conditions is available for purposes of training, the college should be established immediately and its first assignment should be to prepare a number of case studies and other data which can be utilized for conducting the training programmes. This may well take about one or two years. It is only when a thorough preparation of this type is made that the training programmes should be started.

(5) It should conduct two types of courses; a longish induction course should be provided for new recruits and shorter courses of 3—6 weeks for officers already in service.

(6) In every course conducted at the college, some officers from every State and a few from the Union Territories should be included. It should be an object of policy to cross-fertilize administrative experience.

(7) It should conduct periodical conferences, seminars and workshops on matters relating to educational administration.

(8) It should conduct a journal on educational administration and maintain a publication wing.

18.54. **Increasing the Strength of the Department.** The most common complaints that were placed before us by the State Education Departments were: they are understaffed; the growth in the Departmental staff does not *precede* but *follows* the growth in the number of educational institutions and is never able to keep pace with it; norms fixing the number of officers required on the basis of educational institutions, teachers and students, distances involved, problems of transportation and such other relevant factors are not generally fixed and, even if fixed in theory, are not observed in practice; the expenditure for increasing the Departmental staff always has a low priority and is not sanctioned automatically when programmes of expansion are approved; and the axe of retrenchment within education falls, more often than not, on the departmental staff. Most of these complaints are genuine. We recommend a reversal of these policies, subject to one reservation. It is better to have a fewer officers at a higher level than a large number of officers at a lower level and on inadequate scales of pay. Our recommendations regarding the new techniques for administration and supervision provide for this;[1] and this point should be kept in view in the proposed reorganization of the State Education Departments.

PROCEDURES

18.55. **The Present Position.** The existing procedures in educational administration suffers from an excessive emphasis on uniformity and rigidity. In every State, we heard complaints by the headmasters of government schools that almost every detail of the life of a school was regulated by the orders of the Department. The managements of private institutions also complained of rigid Departmental attitudes and attempts at controlling even the smallest details. The need to change these old traditions cannot be over-emphasized. The idea of creating uniformity and regulating the educational process through comprehensive Departmental codes has been overdone and has killed all freedom and initiative and reduced experimentation to the minimum. We must now initiate a new process under which the administration will be distinguished by elasticity and dynamism. As Dr. J. W. Gardner observes: 'The rule book grows bigger as the ideas grow fewer. Thus almost every well-established organization is a coral reef of procedures that were laid down to achieve some long-forgotten objective. An organization must therefore have some means of combating the process by which men become prisoners of their own procedures.'

18.56. **Introducing Elasticity and Dynamism.** How can this elasticity and dynamism be introduced in educational administration? We have made a number of suggestions in this regard in the earlier chapters. Here we would like to emphasize some general suggestions:

(1) The first is a change in the attitude of the administrator. He should cultivate an openness of mind and a spirit of inquiry rather than a rule-of-thumb approach which tries to stick to established practices, even when they cease to be meaningful. It is here that research in educational administration and the in-service training of educational administrators can play a significant role.

(2) The second is to establish a practice of holding periodical reviews, say, every three to five years, of important administrative practices, with a view to chopping off dead-wood and putting in fresh grafts, where necessary.

(3) The third is to build up inter-State contacts and to encourage comparative studies in different State practices in all administrative matters. The study of educational administration developed in the USA out of one peculiar feature: the variety of administrative practices in the different States which arose from the fact that education was a State subject. This variety led to a comparative study of different practices in each aspect of administration. This comparison was originally restricted to mere tabulations which showed the differences. But it soon led to a discussion about the origin of these differences, the fundamental principles on which each such practice should be based, and a comparison of the relative advantages and disadvantages of different practices. Out of this arose a science of educational administration and when the States

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[1] Chapter X.

were confronted with those comparative studies year after year, they were stimulated to think and to make innovations. This happy and fruitful cross-fertilization of administrative practices has not occurred in India[1]. There are hardly any comparative studies it has conducted or promoted in educational administration with the result that the intellectual contact between the different State Education Departments is very little. We find officers in every State Education Department who know about the USA, the UK, or the USSR, but they do not know what is happening in other States of India. If periodical comparative studies in educational administration could be prepared and the State Education Departments closely involved with them, the sad picture would soon disappear and administrative efficiency will begin to rise.

(4) An area in which there is scope for improvement in our administrative practices is that of project preparation. Modern administrative practices in both the armed forces and industry require a systematic analysis and preparation before an operation or new activity is launched. In education, too often the practice is to describe a scheme in a page or two with some sketch of the budget required and to begin operation with no more preparation than this. Where large sums of money are to be spent, a series of preparatory steps are all justified beginning from feasibility studies and going through to detailed, step-by-step plan of operations for the project. This detailed programming of the planned projects will ensure more economic use of resources and more detailed evaluation of the progress being made in project implementation. The evolution of this technique and the training of officers in them is the responsibility of the State Institutes of Education and the National Staff College for Educational Administrators.

(5) The traditional system of administration is based on the principle of having a few officers who are assisted by a large army of superintendents, assistants and clerks, because it was originally devised at a time when the administration had to be run by a few Englishmen with the assistance of a large number of Indians in subordinate positions. Under a system of this type, most of the work tends to be done by unimaginative persons at a lower level who were described by Burke as the 'tyrants of the desk'. This is one contributory cause to the rigidity of the system. We, therefore, recommend that the modern 'officer-oriented system' where most of the work will be done by officers at their own level with the help of a small secretariat staff should be adopted.

18.57. **Education Acts.** At present the educational legislation in the country presents a motley picture: in most States, it is scattered in a number of laws and the bulk of it is still in the form of executive orders, the only State to have an Education Act being Kerala. We, therefore, recommend that education should be given a statutory basis everywhere and in all sectors and that an Education Act should be passed in all the States and Union Territories. This should be a comprehensive and consolidating measure which will replace all the miscellaneous laws which now exist and which will also provide a statutory basis for certain important aspects of administration (for example grant-in-aid code) which now exist merely in the form of executive orders.

18.58. We also recommend that the Government of India should issue a Statement on the National Policy in Education which should provide guidance to the State Governments and the local authorities in preparing and implementing education plans in their areas. The possibility of passing a National Education Act may also be examined.

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[1] One illustration may suffice. A comparative study of the systems of grant-in-aid, an important issue, was first made by the Indian Education Commission in 1882; it was repeated by Ritchie in 1922, and has not been done since.

CHAPTER XIX

EDUCATIONAL FINANCE

I. *Total Educational Expenditure* (1950-65). (2—6).

II. *Pattern of Educational Expenditure* (1950-65). (7—13).

III. *Sources of Educational Expenditure* (1950-65). (14—17).

IV. *Sources of Educational Expenditure* (1965-85). (18) Contributions of local authorities; (19) Contributions of voluntary organizations; (20) Centre-State relationship in the financing of education.

V. *Total Educational Expenditure* (1965-85). (22 Estimate of resources likely to be available for education during the next 20 years.

VI. *Expenditure per Student.* (28) Pattern of cost per student in the first three plans; (30) Pattern of cost per student during the next 20 years; (31) School education; (34) Higher education.

VII. *Adult Education.* (37).

VIII. *Some General Observations.* (39—44).

19.01. In this chapter, we shall examine a few major issues relating to the financing of education. These will mainly include a survey of the growth of educational expenditure in India in the post-independence period and of the sources of educational finance. We shall also refer to the order of financial resources likely to be available for education during the next two decades, their appropriate allocation to various sectors and priorities involved. The questions of fundamental importance that arise are:

— What should be the total level of financial support for education at all levels to ensure achievement of national goals and rapid advancement of national economy, cohesion and security?

-- What judgment and guidelines can be formulated, and with what degree of reliability and confidence, about the distribution of funds between different levels or stages of education (including research) and different sectors within a level?

— Although quality and quantity are inseparable, what proportions of the total resources should be broadly devoted to improvement of quality and consolidation and to the expansion of education?

These questions, by their very nature, do not permit of precise answers because they are not questions in arithmetic or production engineering but in human dynamics involving complex sociological considerations. Difficulties really arise when one tries to give precise values to quantities which are essentially vague. However, if dealt with in the proper perspective, the exercise affords insight and helps the process of decision making.

TOTAL EDUCATIONAL EXPENDITURE (1950—65)

19.02. The discussion may conveniently begin with an examination of the manner in which the total educational expenditure has increased in the post-independence period. In 1946-47, the total educational expenditure in 'British' India was Rs. 577 million which worked out at only Rs. 1.8 per head of population. At the end of the third plan, the total expenditure on education is estimated at Rs. 6,000 million or approximately Rs. 12 per capita (at current prices). The details will be found in Table 19.1.

TABLE 19·1. TOTAL EDUCATIONAL EXPENDITURE IN INDIA (1950-51 to 1965-66)

		1950-51	1955-56	1960-61	1965-66 (estimated)
1.	Total educational expenditure from all sources (Rs. in millions)	1.444	1,897	3,444	6,000
2.	Index of growth	100	166	301	524
3.	Educational expenditure *per capital* (Rs.)	3·2	4·8	7·8	12·1
4.	Index of Growth	100	150	244	378
5.	Total national income (at current prices) (Rs. in millions)	95,300	99,800	141,400	210,000
6.	Index of growth	100	105	148	220
7.	National income *per capital* (at current prices) (Rs.)	266·5	255·0	325·7	424·4
8.	Index of growth	100	96	122	159
9.	Total educational expenditure as percentage of national income	1·2	1·9	2·4	2·9
10.	Index of growth	100	158	200	242
		First Plan	Second Plan	Third Plan	All Three Plans
11.	Average annual rate of growth of total educational expenditure	10·6%	12·7%	11·8%	11·7%

Source. The educational data for 1950-51, 1955-56 and 1960-61 have been taken from Form A of the Ministry of Education. Those for 1965-66 have been estimted in the Commission's Secretariat. The data relating to National Income are taken from CSO (the figure for 1965-66 is a rough estimate).

N.B. The total educational expenditure given here does not include·

(1) expenditure incurred by the guardians of the students on their education, except fees paid:

(2) the 'opportunity costs' which are defined as the foregone income which would have been earned by the students if they had engaged themselves in some direct or indirect productive activity instead of attending the school:

(3) the expenditure figures of unrecognised institutions:

(4) the expenditure on pensions due to retired employees of Government in the Education Department (inclusive of teaching and non-teaching staff): and

(5) the expenditure on administration and other expenditure of private societies conducting educational institutions.

It will be seen that, during the first three plans:

— the total educational expenditure increased from Rs. 1,144 million in 1950-51 to Rs. 6,000 million in 1965-66, which denotes a total increase of 424 per cent in a period of 15 years or a cumulative annual increase of 11.7 per cent. This has varied but little from plan to plan—it stood at 10.6 per cent in the first plan, rose to 12.7 per cent in the second, and dropped to 11.8 per cent in the third.

— the total educational expenditure per capita rose from Rs. 3.2 at the beginning of the first plan to Rs. 4.8 at the end of the first, Rs. 7.8 at the end of the second and Rs. 12.1 at the end of the third—an overall increase of 278 per cent;

— the total educational expenditure represented 1.2 per cent of the national income in 1951. This proportion rose to 1.9 per cent at the end of the first plan, 2.4 per cent at the end of the second and 2.9 per cent at the end of the third. This represents an increase of 142 per cent in 15 years.

— the rate of growth of the educational expenditure in the first three plans (11.7 per cent) is 2.2 times the rate of growth of national income at current prices (5.4 per cent). It is 1.6 times the rate of growth of enrolment and 1.7 times the rate of growth in the number of teachers.[1]

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[1] During this period, the total enrolment in educational institutions has increased from 24,287 thousand in 1950-51 to 70,292 thousand in 1965-66 which shows an average annual rate of growth of 7·3 percent per year. The number of teachers has also increased from 798,192 in 1950-51 to 2,168,786 in 1965-66 which shows a rate of growth of 6·9 per cent per year,

19.03. Three points need emphasis in this context. The first is that the total educational expenditure given in the preceding table is at current prices. Unfortunately, no effort has been made so far to convert the educational expenditure in the country to constant prices. We began this exercise, but it could not be completed due to absence of necessary data. We, however, recommend that such an exercise should be taken up and completed as early as possible. The UGC may consider giving financial assistance to a well-established department of economics of a university for this purpose. We may, however, point out that, during this period, the wholesale price index has risen by about 53 per cent and the cost of living index for the working classes by about 65 per cent. Although these indices cannot be used to reduce the total educational expenditure to constant prices, they indicate that a good deal of the increase in total educational expenditure is due merely to a rise in the price level.

19.04. The second point is that the proportion of national income devoted to education in India is small in comparison with that in educationally advanced countries of the world. The absolute amount per capita spent by us on education is about one-hundredth of that spent by a highly industrialized country like the USA. This reflects the close interaction and interlocking between the level of education and the level of industrialization. Japan and the USA and the USSR are spending considerably more than 6 per cent of their GNP on education, about twice as much as India. In making international comparisons, however, one should not miss the important point that in countries with low levels of national incomes, the disposable surplus is much smaller and it is, therefore, far more difficult for them to make a given effort for education than for those countries which have a comparatively higher income per capita and in consequence, a larger disposable surplus. For instance, an educational expenditure of 3 per cent of the national income in India, where the national income per head is only about Rs. 400, has to be regarded as a much higher degree of 'effort' than an expenditure on the same or even higher percentage of the national income in the UK or the USA.

19.05. The third point is that the increase of educational expenditure has been much faster than that of the growth of economy. The overall resources available to education are a function of two variables—ability or the national income per head of population and effort or the proportion of national income allocated to education. During the first three plans, ability has shown a relatively lower rate of growth. Between 1950 and 1965, the total national income rose from Rs. 91,400 million in 1950-51 to Rs. 163,600 million in 1965-66 (at 1960-61 prices) which implies that the national economy grew only at about 4 per cent per year and that the income per head of population increased only from Rs. 256.5 to Rs. 330.7 which implies a growth-rate of only 1.7 per cent per year. It is unfortunate, that, in 1965-66, there has been a bad failure of the monsoon so that the net national product in the primary sector has been very adversely affected and the total national income threatens to be about 3 per cent less than that in 1964-65. But even if this year is set aside, the growth in total national income between 1950-51 and 1964-65 would be only 4.5 per cent per year and that in the per capita income (from Rs. 256.5 to Rs. 348.7) only 2.2 per cent per year. Since the precise figures of educational expenditure at constant prices are not available, it is not possible to compare the rate of growth of ability, at constant prices, with the rate of growth of effort. But there is enough indirect evidence available to show that, even at constant prices, the rate of growth in educational expenditure far exceeds that in the national income.

19.06. A more precise comparison is however, possible at current prices. As shown in Table 19.1 the national economy has grown at 5.4 per cent per year during the first three plans while educational expenditure has grown at the rate of 11.7 per cent per year. The effort or the national income devoted to education has thus increased at more than twice the rate of ability or national income.

PATTERN OF EDUCATIONAL EXPENDITURE (1950—65)

19.07. We may now pass on to examine how the available financial resources are allocated to different sectors and programmes of education at present. From this point of view, the data regarding educational expenditure by objects for two years—1950-51 and 1965-66—are given in Table 19.2.

TABLE 19·2. EDUCATIONAL EXPENDITURE BY OBJECTS IN INDIA (1950-51 to 1965-66)

Object	Total expenditure (Rs. in 000's)		Percentage of total expenditure		Average annual rate of growth
	1950-51	1965-66	1950-51	1965-66	
A. Direct Expenditure					
1. Pre-Primary Schools	1,198	11,000	0·1	0·2	15·9
2. Lower Primary Schools	364,843	1,220,500	31·9	20·3	8·4
3. Higher Primary Schools	76,990	717,500	6·7	12·0	16·0
TOTAL (FIRST LEVEL)	443,031	1,949,000	38·7	32·5	10·4
4. Secondary Schools	230,450	1,181,000	20·1	19·7	11·5
5. Vocational Schools	36,944	250,000	3·2	4·2	13·6
6. Special Schools	23,335	39,920	2·0	0·7	3·6
7. Boards of Secondary, /Intermediate Education	5,338	45,000	0·5	0·8	15·3
TOTAL (SECOND LEVEL)	296,067	1,515,920	25·9	25·3	11·5
8. Universities	49,052	270,000	4·3	4·5	12·0
9. Research Institutes	6,256	65,000	0·5	1·1	16·9
10. Colleges for Arts and Science	71,714	327,500	6·3	5·5	10·7
11. Colleges for Professional Education	42,194	350,000	3·7	5·8	15·1
12. Colleges for Special Education	2,224	17,500	0·2	0·3	14·7
TOTAL (THIRD LEVEL)	171,440	1,030,000	15·0	17·2	12·7
13. TOTAL (DIRECT)	910,539	4,494,920	79·6	74·9	11·2
B. Indirect Expenditure					
14. Direction and Inspection	27,364	114,009	2·4	1·9	10·0
15. Buildings	99,270	666,055	8·7	11·1	13·5
16. Scholarships, Stipends, etc.	34,456	420,035	3·0	7·0	18·1
17. Hostels	18,264	95,463	1·6	1·6	11·7
18. Miscellaneous	53,928	209,518	4·7	3·5	9·5
19. TOTAL (INDIRECT)	233,282	1,505,080	20·4	25·1	13·2
20. GRAND TOTAL	1,143,822	6,000,000	100·0	100·0	11·7

Source. Ministry of Education, Form A.

N.B. The educational expenditure given in Table 19.2 is divided into two categories —direct and indirect—in accordance with the classification adopted by the Ministry of Education. Some clarifications are, however, necessary to relate this classification to the usual classification of 'recurring' and 'capital' expenditure. All expenditure which is classified as 'direct' is recurring in character. All items of expenditure classified as 'indirect' are also recurring except in the case of 'buildings'. (This head includes all capital expenditure on buildings but does not include expenditure on their maintenance). Expenditure shown under hostels includes only the maintenance charges but does not include the capital expenditure on the construction of hostel buildings and the food charges of the inmates.

19.08. It will be seen that the indirect expenditure given in the preceding table is not divided according to different stages or sectors of education. We, therefore, divided this expenditure, on the assumptions given below, into two sectors—school and university. Our calculations are given in Table 19.3.

TABLE 19·3. INDIRECT EXPENDITURE AT SCHOOL AND UNIVERSITY STAGES

	1950-51		1965-66	
	Amount (Rs. in 000's)	Percentage of total expenditure	Amount (Rs. in 000's)	Percentage of total expenditure
School Education				
1. Direction and Inspection	27,364	2·4	114,009	1·9
2. Buildings	39,708	3·5	133,211	2·2
3. Scholarships	24,705	2·2	210,017	3·5
4. Hostels	5,479	0·5	19,093	0·3
5. Miscellaneous	26,964	2·4	104,759	1·7
TOTAL	124,220	10·9	581,089	9·7
Higher Education				
1. Direction and Inspection		.	..	..
2. Buildings	59,562	5·2	532,844	8·9
3. Scholarships	9,751	0·9	210,018	3·5
4. Hostels	12,785	1·1	76,370	1·3
5. Miscellaneous	26,964	2·4	104,759	1·7
TOTAL	109,062	9·5	923,991	15·4

N.B. (1) The expenditure on buildings has been divided, on the basis of general trends noticed, as 40:60 in 1950-51 and 20:80 in 1965-66.

(2) The break-down of the expenditure on scholarships for 1950-51 (actuals) is available. That for 1965-66 is an estimate made in the Secretariat of the Commission on the basis of present trends.

(3) The expenditure on hostels is largely at the university stage. It was divided, on the basis of general trends noticed, as 30:70 in 1950-51 and 20:80 in 1965-66.

(4) The miscellaneous expenditure was divided, on an *ad hoc* basis, in the proportion of 50:50.

(5) Totals do not tally due to rounding.

19.09. On the basis of the above break-up, the expenditure at the three levels of education will be as shown in Table 19·4.

TABLE 19·4. EDUCATIONAL EXPENDITURE BY LEVEL

	1950-51	1965-66
1. *First level* i.e., pre-primary, lower primary and higher primary schools.	% 38·7	% 32·5
2. *Second Level* i.e., secondary, special and vocational schools and Board of Secondary Education	25·9	25·3
3. Indirect expenditure on school education	10·9	9·7
TOTAL	75·5	67·4
4. *Third Level* i.e., Universities, research institutions, and colleges of general, special and professional education	15·0	17·2
5. Indirect expenditure on higher education	9·5	15·4
TOTAL (UNIVERSITY)	24·5	32·6
	100·0	100·0

N.B. Totals do not tally due to rounding.

19.10. In the initial stages of development, the total expenditure on education is generally low and the bulk of it is spent on school education. As societies become industrialized, the total expenditure on education begins to grow and an increasingly larger part of it comes to be devoted to higher education and research. This broad trend is maintained in spite of the increase that takes place in the expenditure on school education on account of universalization of primary education, expansion (or even universalization) of secondary education, and the qualitative improvement of school education. The growth of educational expenditure in Japan as seen in Table 19.5. will show this clearly.

TABLE 19·5. EDUCATIONAL EXPENDITURE IN JAPAN (1885—1960)

Year	Distribution of expenditure by level of education (percentage)					Percentage of GNP spent on education	GNP in million yen
	Elementary education I—VI	Secondary education VII—XII	Higher education XIII and above	Teacher training	Total		
1885	84·3	2·8	8·3	4·6	100·0	1·8	612
1890	76·9	3·1	10·9	9·1	100·0	1·0	924
1900	67·6	16·5	7·0	8·9	100·0	2·1	1,997
1910	67·4	16·7	10·0	5·9	100·0	3·0	2,888
1920	67·6	17·6	10·9	3·9	100·0	2·5	11,845
1935	61·9	18·7	16·9	2·5	100·0	3·3	15,203
1940	55·7	21·8	20·1	2·4	100·0	2·1	32,183
1950	41·8	46·2	12·0	.	100·0	4·8	3,381,500
1960	42·4	44·5	13·1	..	100·0	5·2	11,821,700

Source. *Japan's Growth and Education*, Ministry of Education, Japan, 1963, Tables 10 and 14.

19.11. It will be seen that, in 1885, the expenditure on elementary education in Japan was as high as 84.3 per cent. of the total. It has now come down to 42.4 per cent. (In Japan, the duration of the elementary course of education is six years as against seven years we are recommending). The expenditure on secondary education, which was only 2.8 per cent in 1885, has now risen to 42.5 per cent. (The course of secondary education in Japan extends over six years, for the first three years of which education is compulsory). In higher education, the expenditure has been steadily growing and risen from 8.3 per cent in 1885 to 13.1 per cent in 1960.

19.12. Some idea of the manner in which expenditure is distributed over the different levels of education in other countries can be had from Table 19.6.

TABLE 19·6. PERCENTAGE DISTRIBUTION OF RECURRING EXPENDITURE ON EDUCATION BY LEVEL AND TYPE OF EDUCATION, 1961

Country	Central adminis-tration	Pre-primary and 1st level	Second level			Third level	Other types of edu-cation	Total
			Total	General	Vocational and teacher training			
1	2	3	4	5	6	7	8	9
Brazil	10·1	33·4	19·5	..	..	20·0	17·0	100·0
France	1·9	48·3	29·2	18·0	11·2(*a*)	8·3	12·3	100·0
Germany (F.R.)	1·5	48·1(*b*)	35·8	23·1	12·7(*a*)	13·2	1·4	100·0
Ghana	13·2	26·7	33·1	18·7	14·4	17·2	9·8	100·0
Nigeria	9·4	53·8	29·0	12·6	16·4	5·1	2·7	100·0
Pakistan	5·5	42·9	23·8	19·1	4·7	19·6	8·2	100·0
Turkey	.	61·3	32·4	13·4	19·0	1·4	4·9	100·0
U.K. (England & Wales)	4·1	27·1	38·8	31·5	7·3(*a*)	14·1	15·9	100·0
U.S.A.	..	72·4(*c*)	..(*d*)	..	..	27·6	..	100·0
U.S.S.R.	0·5	71·2(*c*)	..(*d*)	..	..	13·3	15·0	100·0
Yugoslavia (*e*)	4·5	58·3	19·3	..	..	16·1	1·8	100·0

Source. Compiled by the Commission's Study Team from documents available in the UNESCO Secretariat, Paris.
(*a*) Excludes expenditure on teacher training.
(*b*) Includes expenditure on special education.
(*c*) Includes expenditure on second level of education.
(*d*) Included under pre-school and first level of education.
(*e*) 1960.

19.13. The Indian picture in this context can be seen in the statistics given in Table 19.7.

TABLE 19·7. GROWTH OF EDUCATIONAL EXPENDITURE IN INDIA ACCORDING TO OBJECTS (1881-1960)

(Rs. in 000's)

	1881-82	1891-92	1901-02	1911-12	1921-22	1936-37	1946-47	1960-61
1. Primary Schools	7,087 (44·0)	9,614 (31·5)	11,876 (29·6)	20,726 (26·4)	50,908 (27·7)	81,260 (29·9)	184,853 (32·1)	734,461 (21·3)
2. Secondary Schools	3,912 (24·3)	9,896 (32·4)	12,684 (31·6)	20,789 (26·5)	48,727 (26·5)	81,300 (29·9)	170,230 (29·5)	1,118,336 (32·5)
3. Vocational and Special Schools (including training)	453 (2·8)	1,711 (5·6)	2,280 (5·7)	5,374 (6·8)	13,701 (7·5)	18,595 (6·8)	34,657 (6·0)	146,088 (4·3)
4. Boards of Intermediate and Secondary Education	..	..	..	..	..	324 (0·1)	974 (0·2)	24,133 (0·7)
TOTAL (SCHOOLS)	11,452 (71·1)	21,221 (69·5)	26,840 (66·9)	46,889 (59·7)	113,336 (61·7)	181,479 (66·7)	390,714 (67·8)	2,023,018 (58·8)
5. Universities	163 (1·0)	473 (1·6)	772 (1·9)	1,588 (2·0)	7,341 (4·0)	13,208 (4·9)	22,977 (4·0)	141,388 (4·1)
6. Arts and Science Colleges	1,332 (8·3)	2,044 (6·7)	2,601 (6·5)	4,799 (6·1)	11,042 (6·0)	16,662 (6·1)	43,915 (7·6)	236,139 (6·9)
7. Professional and Special Colleges	..	829 (2·7)	1,197 (3·0)	2,253 (2·9)	5,978 (3·2)	8,138 (3·0)	18,659 (3·2)	167,166 (4·9)
TOTAL (UNIVERSITIES)	1,495 (9·3)	3,346 (11·0)	4,570 (11·4)	8,640 (11·0)	24,361 (13·2)	38,008 (14·0)	85,551 (14·8)	544,693 (15·9)
8. Direction & Inspection	1,628 (10·1)	2,250 (7·4)	2,545 (6·3)	4,775 (6·1)	9,335 (5·1)	11,407 (4·2)	18,238 (3·2)	70,123 (2·0)
9. Buildings	838 (5·2)	2,182 (7·1)	2,573 (6·4)	9,730 (12·3)	19,761 (10.8)	18,197 (6·7)	28,453 (4·9)	428,158 (12·4)
10. Scholarships	399 (2·5)	727 (2·4)	912 (2·3)	1,340 (1·7)	3,176 (1·7)	(a)	(a)	200,222 (5·8)
11. Miscellaneous	298 (1·8)	794 (2·6)	2,681 (6·7)	7,219 (9·2)	13,784 (7·5)	22,766 (8·4)	53,657 (9·3)	171,711 (5·1)
TOTAL (INDIRECT)	3,163 (19·6)	5,953 (19·5)	8,711 (21·7)	23,064 (29.3)	46,056 (25·1)	52,370 (19·3)	100,348 (17·4)	870,214 (25·3)
GRAND TOTAL	16,110 (100·0)	30,520 (100·0)	40,121 (100·0)	78,593 (100·0)	183,753 (100·0)	271,857 (100·0)	576,613 (100·0)	3,443,801 (100·0)

(a) Included under Miscellaneous.

(b) Includes expenditure on pre-primary schools also.

NOTE. The figures in parentheses indicate the percentage to total expenditure.

It will be seen that before independence the position remained more or less stationary in India for a period of about sixty years—the direct expenditure on school education decreasing only from 71·1 per cent in 1881-82 to 67·8 per cent in 1946-47 and that on higher education rising only from 9·3 per cent to 14·8 per cent during the same period. The position, however, changed radically with the attainment of independence. Steps began to be taken for industrialization and hence greater expenditure was incurred on higher education, science and scientific research, technical and technological education, etc. By 1965-66, therefore, expenditure on higher education increased considerably. As will be seen from the data given in paragraph 19·09 earlier, the present position is that about one-third of the total expenditure is devoted to the first level of education; another one-third is devoted to the second level and to the indirect expenditure on school education; and the remaining one-third is devoted to higher education.

SOURCES OF EDUCATIONAL EXPENDITURE (1950—65)

19.14. We shall now proceed to examine the sources of educational expenditure during the first three plans. Due to various historical reasons, a multi-source finance system has grown in the country and education is now financed by the Central Government, State Governments and local authorities, and through fees and 'other' sources which include endowments, donations and other voluntary contributions from the public. This has helped to raise more resources in the aggregate than would otherwise have been possible and has also shown a certain resilience in times of difficulties by setting off, to some extent, the shortfalls in one source by increase in others. Table 19.8 shows how the contribution of each source has increased during the first three plans.

TABLE 19·8. EDUCATIONAL EXPENDITURE IN INDIA BY SOURCES (1950-51 to 1965-66)

Source	1950-51	1955-56	1960-61	1965-66 (estimated)
1. *Government funds*				
(i) Total expenditure (Rs. in 000's)	652,678	1,172,049	2,340,914	4,271,856
(ii) Index of growth	100	179	359	655
(iii) Percentage of total expenditure on education	57·1	61·8	68·0	71·2
2. *Local Authorities' Funds*				
(i) Total expenditure (Rs. in 000's)	124,987	163,548	224,914	378,031
(ii) Index of growth	100	131	180	302
(iii) Percentage of total expenditure on education	10·9	8·6	6·5	6·3
3. *Fees*				
(i) Total expenditure (Rs. in 000's)	233,272	379,033	590,258	918,077
(ii) Index of growth	100	162	253	394
(iii) Percentage of total expenditure on education	20·4	20·0	17·1	15·3
4. *Other Sources*				
(i) Total expenditure (Rs. in 000's)	132,885	181,980	287,715	432,036
(ii) Index of growth	100	137	217	325
(iii) Percentage of total expenditure on education	11·6	9·6	8·4	7·2
5. *Average Annual Rate of Growth*	First Plan	Second Plan	Third Plan	All Three Plans
(i) Government funds	12·4	14·8	12·8	13·3
(ii) Local authorities' funds	5·5	6·6	10·9	7·3
(iii) Fees	10-3	9·2	9·2	9·6
(iv) Other sources	6·5	9·6	8·5	8·1

Source. Ministry of Education, Form A.

It will be seen that the largest increase has taken place in the expenditure from government funds (555 per cent or an average annual growth of 13·3 per cent)—this is only to be expected—and they now contribute 71·2 per cent of the total expenditure as against 57.1 per cent in 1950-51. Consequently, the contribution of all other sources has proportionately declined, although it has increased in absolute terms. The next important source is fees whose contribution has increased by 294 per cent (or 9·6 per cent per year); it now accounts for 15·3 per cent of the total educational expenditure. Then come other sources whose contribution has increased by 225 per cent (or 8·1 per cent per year) and which now bear only 7·2 per cent of the total expenditure. The local authorities whose resources are inelastic, particularly in rural areas, account for 6·3 per cent of the total expenditure only and they also show the lowest increase in contribution—202 per cent (or 7·3 per cent per year).

SOURCES OF EDUCATIONAL EXPENDITURE (1965—85)

19.15. What would be the probable developments relating to sources of educational expenditure in the next 20 years? It will be seen from the above that the responsibility for the financing of education at all stages is falling increasingly on government funds (Central and State). This trend will increase in the future. The total revenue from fees will be considerably reduced when, as we have recommended elsewhere,[1] education up to the end of the lower scondary stage is made tuition-free and a much larger provision of free-studentships is made in higher secondary and university education to meet the needs of the young persons from the under-privileged sections of society who are now coming into the universities and colleges. Similarly, the income from other sources would not rise in proportion to the increase in total educational expenditure. The local authorities also may not be able to provide more than a very small percentage of the total expenditure, even after they have made the best effort to raise their contribution. Taking an overall view of the situation, therefore, it appears that the funds of the Central and State Governments would have to bear about 90 per cent (or even more) of the total educational expenditure.

19.16. While it is true that most of the responsibility for the support of education should thus be squarely placed on governmental funds, a total centralization of all financial responsibility for education would also not be desirable, because it deprives the agencies at the school and local levels of all initiative in the matter. Even though the resources thus raised may not be large, the provision of administrative arrangements under which such initiative can exist and is even encouraged is of very great educational significance and will stimulate parental and local interest in education and help to raise standards. We, therefore, recommend that attempts should continue to be made to raise as much contribution as possible from local communities, voluntary organizations and local authorities to support educational development.

19.17. **Contribution of Local Communities.** We have recommended earlier that the local communities should be closely associated with all government and local authority schools and that a school fund should be established in every school to meet the whole or part of the non-teacher costs.[2] We have further recommended that as part of the organization of a nation-wide programme of school improvement, the assistance of the local communities should be fully harnessed for improving the physical facilities in schools on the lines of the school improvement conference organized in Madras State[3]. In the case of private schools, we have suggested that the management should be able to raise a fair proportion of all the non-recurring costs and in addition, a prescribed percentage of recurring costs.[4] Apart from their principal advantages of stimulating local interest in education, these contributions from the local communities and the public will also help to some extent in financing education.

19.18. **Contributions of Local Authorities.** The local authorities—municipalities and zila parishads—will be able to make a fair contribution in support of educational development. In our opinion, it would be possible to maximise these contributions if a suitable system of grant-in-aid is adopted. The broad features of such a system are indicated in Supplemental Note I given at the end of this chapter.

19.19. **Contributions of Voluntary Organizations.** The voluntary organizations conducting educational institutions are also making a contribution to total educational expenditure. This can be stimulated and utilised for the purpose of development through appropriate policies of grant-in-aid. We have discussed these issues separately for school and higher education elsewhere.

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[1] Chapter VI.
[2] Chapter X.
[3] Chapter X.
[4] Chapter X.

19.20. **Centre-State Relationship in the Financing of Education.** Between them, the Centre and the State Governments now contribute about 71 per cent of the total educational expenditure; and as stated above, this will rise to 90 per cent by 1985-86. The problem of Centre-State relationship in the financing of education is thus of great importance. We have discussed it, in the appropriate contexts, in the earlier chapters of this Report. A brief reference to it has also been made in Supplemental Note I given at the end of this chapter.

TOTAL EDUCATIONAL EXPENDITURE (1965—85)

19.21. We now come to the more difficult part of our task, namely, to estimate the magnitude of the resources likely to be available for educational development during the next 20 years, and the best manner of their allocation to different sectors or stages of education.

19.22. **Estimate of Resources Likely to be Available for Education During the Next Twenty Years.** In comparison with the last 15 years, the programme of educational development to be undertaken during the next two decades will be greater in magnitude and hence the total educational expenditure will have to increase much more. This would be possible only if there is increase both in ability and effort. The rate of growth of the economy has to be speeded up during the next two decades and this should be combined with a programme of population control. Also, the effort to increase allocations to education should be intensified. As stated earlier, it is difficult to be precise about these matters. We should, however, broadly work towards increasing the educational expenditure *per capita*, in a period of 20 years, to between 4 and 5 times the present level of Rs. 12 (at constant prices). This could be reached by a variety of combinations of different assumptions about the three variables involved, namely, economic growth (varying from 5 per cent to 7 per cent per annum), population growth (varying from 1·5 per cent to 2·5 per cent per annum), and the proportion of national income devoted to educational expenditure (varying from 4 per cent to 6 per cent). What we have in view, however, are developments on the following lines:

TABLE 19·9. TOTAL EDUCATIONAL EXPENDITURE (1965-85)

	1965-66	1970-71	1975-76	1980-81	1985-86
1. National income at 1965-66 prices—Increase assumed at 6 per cent per annum (Rs. in millions)	210,000	281,000	376,000	503,000	673,000
2. Index of growth	100	134	179	240	320
3. Population estimates (Medium projection in millions)	495	560	630	695	748
4. Index of growth	100	113	127	140	151
5. National Income per head of population (Rs.)	424	502	597	724	900
6. Index of growth	100	118	141	171	212
7. Total educational expenditure (Rs. in millions) (increase assumed at 10 percent per annum)	6,000	9,663	15,562	25,063	40,364
8. Index of growth	100	161	259	418	673
9. Percentage of total educational expenditure to national income	2·9	3·4	4·1	5·0	6.0
10. Index of growth	100	117	141	172	207
11. Educational expenditure *per capita* (Rs.) .	12·1	17·3	24·7	36·1	4·0
12. Index of growth	100	143	204	298	446

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[1] Chapters X and XIII.

19.23. It will be seen that we have assumed a middle position with regard to the growth of national income (at 6 per cent per year as between the two other estimates of 5 and 7 per cent per year). Our assumption regarding the growth of population is also a medium estimate (2·1 per cent per year between 1966 and 1985 as against the two other estimates of 1·5 and 2·5 per cent per year). With regard to the proportion of national income devoted to education, we have assumed the highest rate of 6 per cent (out of the three possible assumptions of 4, 5 and 6 per cent) because we should accord the highest priority to education and allocate the largest proportion of GNP to it. We thus get a medium estimate of Rs. 54 per head of population by 1985-86. In this connection, chart on page 475 may also be seen.

It should, however, be noted that these assumptions cover a wide range of *per capita* costs:

(1) If national income grew at 5 per cent per year, population at 2·5 per cent per year, and 4 per cent of national income were allocated to education, the expenditure on education in 1985-86 would be only Rs. 27·5 *per capita*.

(2) If national income grew at 7 per cent per year, population at 1·5 per cent per year and 6 per cent of the national income were allocated to education, the expenditure on education in 1985-86 would be as high as Rs. 75·1 *per capita*.

The figure of 6 per cent of GNP invested in education by 1986 may seem to be an ambitious target. We do not quite hold this view. It is only in recent years that nations, realising the deep and symbiotic link between education and national prosperity, have been increasing rapidly their investments in education and this trend is likely to continue. At the beginning of this century even 'advanced' countries such as the USA spent no more than a small fraction of their GNP on education. By 1986, it is likely that a figure of 10 per cent of GNP invested in education will become commonplace in most countries. If total and comprehensive disarmament is achieved by then, as we all hope it will be, the figure for the developing countries may even exceed 10 per cent; and it is only through some such action that the dismal and dangerous gap between the poor and rich countries can be reduced to tolerable dimensions.

19.24. It has been suggested that in early stages of educational development the rate of growth of educational expenditure ought to be approximately twice the rate of growth of national income. In our exercise, however, we have postulated a relatively more modest annual rate of growth of 10 per cent for educational expenditure relative to the assumed rate of growth of 6 per cent in national income. It should thus be possible to implement the schemes of educational expenditure at postulated levels even in the face of shortfalls in the rate of growth of national income. It may be added that the basis of such projections is the expected pattern of individual and collective consumption behaviour as incomes increase, combined with the educational effort needed for sustaining higher levels of economic activity.

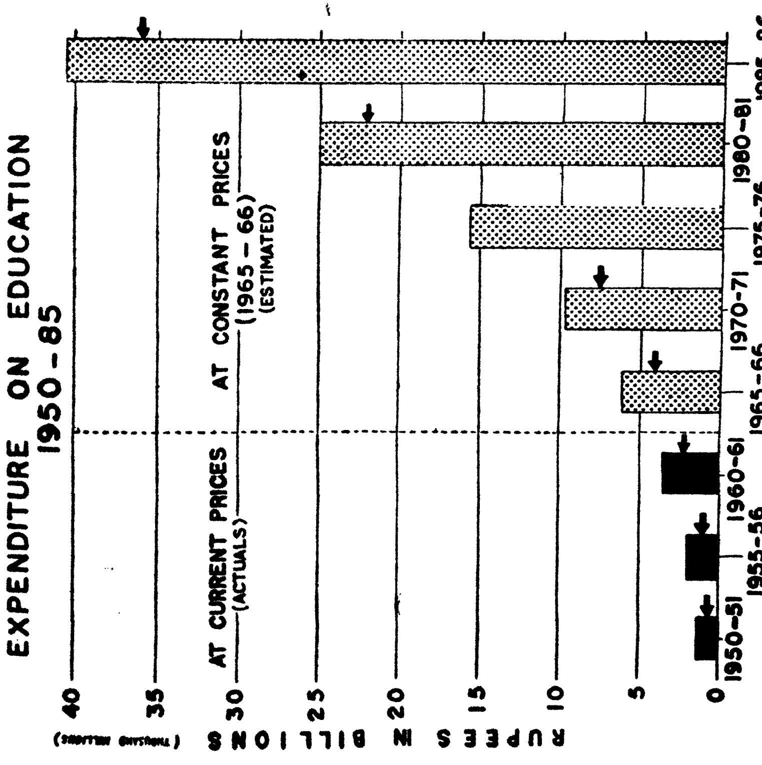
19.25. What will be the pattern of allocation of resources to different sectors of education in future? In our view, this pattern will change from decade to decade.

(1) In the first decade, an emphasis on a larger allocation to the school stage is needed. In the first place, it is necessary to upgrade the salaries of school teachers. The allocation needed for this purpose will be very large, partly because of the large numbers involved and partly because of the size of the increment which has to be given without delay. Secondly, we are proposing to transfer the PUC and the Intermediate classes from the university to the school stage. Thirdly, there is an urgent need to provide at least five years' of effective education to all children in the country. Fourthly, it is equally necessary to vocationalize secondary education.

(2) In the second decade, seven years' of effective primary education will have to be provided. Secondly, emphasis will have to be placed on adding one year to the school stage and vocationalizing secondary education. But the additional allocation required for the purpose is not relatively so large as in the first decade and the emphasis will shift a little in favour of higher education.

(3) In the third decade, the programmes at the secondary stage will be nearing completion and the emphasis will shift very largely to the development of higher education and research. As time passes, this

EXPENDITURE ON EDUCATION 1950 - 85

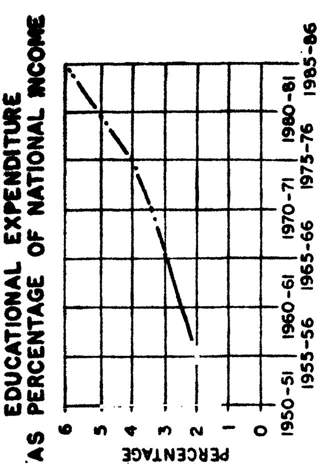


NOTE :—

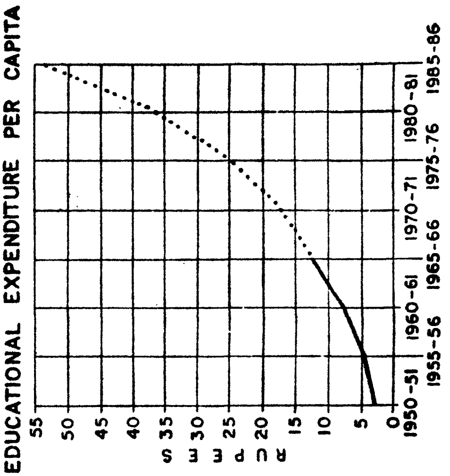
1 THE PORTION BELOW THE ARROW (⬅) REPRESENTS EXPENDITURE MET FROM GOVERNMENT FUNDS AND THAT ABOVE IT FROM OTHER SOURCES.

2 THE DOTTED BARS REPRESENT ESTIMATED EXPENDITURE AT CONSTANT PRICES OF 1965-66.

EDUCATIONAL EXPENDITURE AS PERCENTAGE OF NATIONAL INCOME



EDUCATIONAL EXPENDITURE PER CAPITA



trend is likely to continue. In this connection, chart on page 477 may also be seen.

19.26. A tentative estimate of the expenditure required for school and higher education in 1975-76 and 1985-86 has been attempted and will be found in the Supplemental Notes II and III given at the end of this chapter. It will be seen therefrom that about 72 per cent of the total expenditure in 1975-76 will be allocated to school education and that higher education will get about 27 per cent instead of about 33 per cent as at present. We would like to point out, however, that this reduction in the proportion of educational expenditure devoted to higher education is more apparent than real. A large part of the expenditure on higher secondary (PUC) stage which has been shown here under 'school' is at present classified as being under 'university'. If due allowance is made for this—this expenditure is of the order of 4 or 5 per cent of the total—it will be seen that the school gets only about two-thirds of the total expenditure as in the past. In the second decade, the expenditure of school education is reduced to 65.9 per cent or about two-thirds of the total. Consequently, higher education will receive a larger allocation.

19.27. It has been argued before us that, in view of the urgency to develop higher education, it may be desirable to go slow with primary education for some time and to invest more of the available resources in secondary and higher education. Some have also argued the other view that we should develop primary education as rapidly as possible and at any cost. The Sargent Plan, for instance, allocated two-thirds of the total resources to primary education. These are extreme views. We realize the need for the development of higher education and for the allocation of more resources to it. But it would not be proper to cut down for this purpose the expenditure on primary education. As we have repeatedly stressed in the Report, the provision of universal primary education is vital on grounds of social justice and to help the process of transformation of the national economy. Again, development of higher education and research is central to the entire developmental programme; and without an adequate provision for higher education there will be no adequate supply of competent teachers for primary and secondary education. What we want is a balanced growth of education. There seems to be no alternative but to adopt the broad pattern of allocation of resources suggested above.

EXPENDITURE PER STUDENT

19.28. **Pattern of Cost Per Student in the First Three Plans.** We shall now turn to a consideration of the expenditure per pupil at each level of education. This depends upon three factors: the average annual salary of a teacher (a); the pupil-teacher ratio (t); and the expenditure on all non-teaching costs which can be expressed as a percentage of the average salary of a teacher (r). Symbolically, it can be stated as follows:

$$\text{Cost per pupil} = \frac{a(1+r)}{t}$$

where a = average annual salary of a teacher
r = ratio of non-teacher costs to teacher's sal
t = pupil-teacher ratio

All these factors have undergone change in each sector during the last fifteen years with the result that the overall cost per student (direct expenditure only) has increased from Rs. 37 per student in 1950-51 to Rs. 64 per student in 1965-66 (at current prices) or by 73 per cent. But if allowance is made for the rise in the cost of living (which is about 65 per cent), the rise in real terms becomes almost negligible. The detailed statistics in this regard are given in Tables 19.10 A and B.

19.29. The problem of the salaries of teachers has already been discussed in Chapters III and XVII. With regard to the other factors, some important conclusions arise from these data.

(1) The cost per pupil/student does not show appreciable increase, except in professional colleges and vocational schools. Even here, if allowance is to be made for the rise in prices, there is actually a fall in expenditure in real terms.

(2) At the pre-primary stage, the cost per pupil has remained almost stationary. It implies that in real terms, the investment per student has gone down very greatly.

(3) At the lower primary stage, the cost per student has gone up by 50 per cent. But, at constant prices, this also implies a fall in real terms. The non-teacher costs per pupil have actually fallen, even at constant prices. That is why our primary schools are so dull and drab. In fact, in many primary schools, we give hardly anything except the teacher! The picture at the higher primary stage is similar.

(4) Expenditure per student in colleges of arts and science shows some increase in current prices, but a fall in real terms.

EXPENDITURE ON EDUCATION, BY LEVELS
1950-85

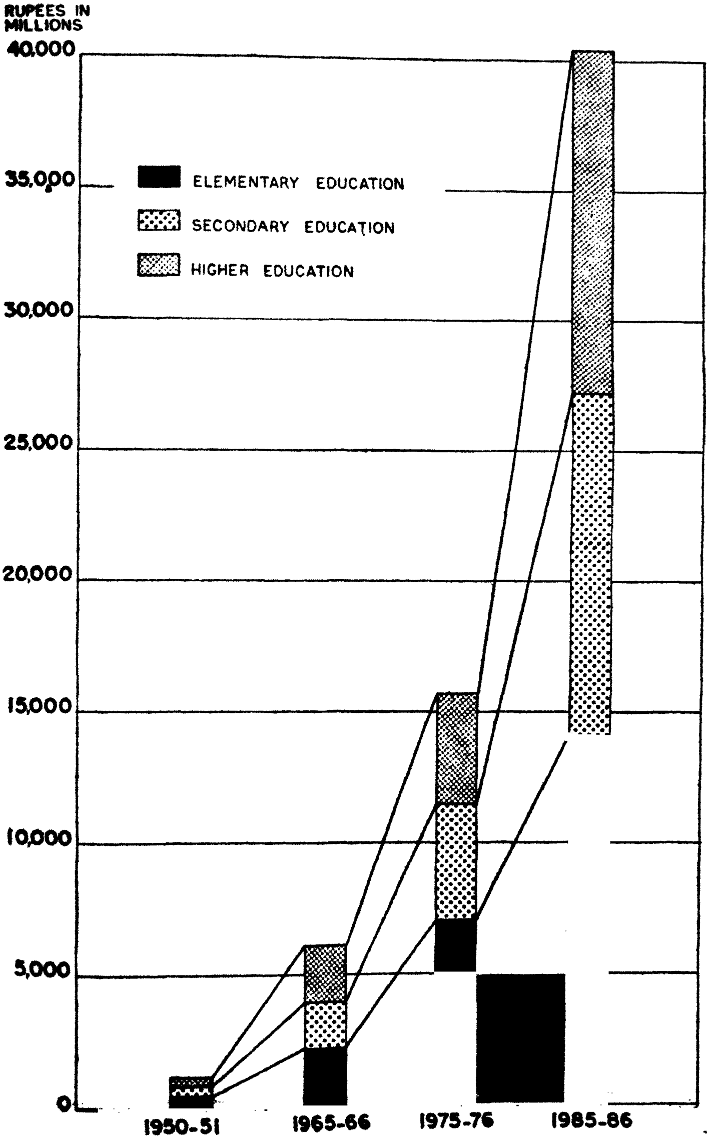


TABLE 19·10 A. AVERAGE ANNUAL COST PER PUPIL (1950-51)

Type of institution	Average annual salary per teacher	Number of pupils per teacher	Percentage of non-teacher costs to teacher costs	Average annual cost per pupil		
				Due to teacher costs	Due to non-teacher costs	Total
	Rs.			Rs.	Rs.	Rs.
Pre-Primary Schools	914	25	51·3	37	19	55
Lower Primary Schools . . .	545	34	24·6	16	4	20
Higher Primary Schools . . .	682	24	32·0	28	9	37
Secondary Schools	1,258	25	44·8	50	23	73
Schools for Vocational Education .	1,705	16	86·8	106	92	197
Schools for Special Eudcation .	715	13	98·5	55	54	109
Universities (Teaching Departments)	3,759	10	N.A.	N.A.	N.A.	N.A.
Colleges of Arts & Science . .	2 696	20	73·7	133	98	231
Colleges of Professional Education .	13,948	11	118·1	357	422	779
Colleges of Special Education .	1.656	8	48·6	203	99	301
TOTAL—DIRECT EXPENDITURE				25	12	37

N.B. Totals do not tally on account of rounding of figures.
Source. Ministry of Education, Form A.

TABLE 19·10 B. AVERAGE ANNUAL COST PER PUPIL (1965-66)

Type of institution	Average annual salary per teacher	Number of pupils per teacher	Percentage of non-teacher costs to teacher costs	Average annual cost per pupil		
				Due to teacher costs	Due to non-teacher costs	Total
	Rs.			Rs.	Rs.	Rs.
Pre-Primary Schools	1,000	31	56·3	35	20	55
Lower Primary Schools . . .	1,046	38	11·1	27	3	30
Higher Primary Schools . . .	1,087	31	12·4	40	5	45
Secondary Schools	1,959	25	37·0	78	29	107
Schools for Vocational Education .	2,887	15	100·0	208	208	417
Schools for Special Education .	991	12	66·7	81	54	135
Universities (Teaching Departments)	6,500	12	N.A.	N.A.	N.A.	N.A.
Colleges of Arts & Science . .	4,000	20	63·8	200	128	328
Colleges for Professional Education .	6,410	11	100·0	583	583	1,167
Colleges for Special Education .	2,918	12	42·9	245	105	350
TOTAL—DIRECT EXPENDITURE .				46	18	64

N.B. Totals do not tally on account of rounding of figures.
Source. Ministry of Education, Form A.

19.30. The Pattern of Cost Per Student During the Next Twenty Years. A tentative estimate of expenditure in the different sectors of school education during the next twenty years is discussed in Supplemental Note II at the end of the chapter. A similar but still more tentative estimate for higher education has been given in Supplemental Note III at the end of the chapter. We shall now briefly discuss their implications and limitations.

19.31. **School Education.** It is comparatively easy to estimate the expenditure on school education because (1) the teacher costs form a proportionately larger part of the total expenditure, (2) the non-teacher costs can be more accurately estimated, (3) there is no variety of courses to be provided at the primary stage, and (4) even at the secondary stage, the variety of courses to be provided in vocational education is comparatively limited and does not show wide variations of costs. These estimates, therefore, are more reliable and better guides to the formulation of educational policies.

19.32. Table 19.11 gives the total estimated expenditure on school education and Table 19.12 gives its implications in terms of teachers' salaries, pupil-teacher ratios, levels of non-teacher expenditure, and maintenance of quality institutions.

TABLE 19·11. EXPENDITURE ON SCHOOL EDUCATION (1975-76 and 1985-86)

	Total expenditure (Rs. in 000's)		Percentage of total expenditure	
	1975-76	1985-86	1975-76	1985-86
1. *Recurring (Direct)*				
Pre-Primary	236,956	488,531	1·5	1·2
Lower Primary	3,749,220	6,129,616	24·1	15·2
Higher Primary	2,451,567	5,140,287	15·8	12·7
TOTAL	6,437,743	11,758,434	41·4	29·1
Lower Secondary :				
General	2,072,510	4,490,088	13·3	11·1
Vocational	359,800	2,582,550	2·3	6·4
TOTAL	2,432,310	7,072,638	15·6	17·5
Higher Secondary :				
General	488,436	1,281,299	3·1	3·2
Vocational	823,900	2,362,250	5·3	5·8
TOTAL	1,312,336	3,643,549	8·4	9·0
TOTAL RECURRING (Direct)	10,182,389	22,474,621	65·4	55·7
2. *Recurring (Indirect)*				
Direction and Inspection	389,050	1,614,560	2·5	4·0
Scholarships	301,680	1,490,240	1·9	3·7
TOTAL	690,730	3,104,800	4·4	7·7
3. *Recurring (Direct and Indirect)*	10,873,119	25,579,421	69·9	63·4
4. *Capital*				
Buildings and Equipment	389,050	1,008,890	2·5	2·5
TOTAL SCHOOL EDUCATION	11,262,169	26,588,311	72·4	65·9

N.B. Totals do not tally due to rounding of figures.
For details, see Supplemental Note II at the end of the chapter.

TABLE 19·12. AVERAGE ANNUAL COST PER PUPIL (1950-51 to 1985-86)

Year	Average annual salary per teacher	Number of pupils per teacher	Percentage of non-teacher costs to teacher costs	Average annual cost: Due to teacher costs	Average annual cost: Due to non-teacher costs	Average annual cost: Total
	Rs.			Rs.	Rs.	Rs.
Pre-primary Education						
1950-51	914	25	51·3	37	19	55
1965-66	1,000	31	56·3	35	20	55
1975-76	1,800	40	50·0	50	25	74
1985-86	2,500	40	50·0	69	34	103
Lower Primary Education						
1950-51	545	34	24·6	16	4	20
1965-66	1,046	38	11·1	27	3	30
1975-76	1,800	50	20·2	43	9	52
1985-86	2,500	45	19·6	67	13	80
Higher Primary Education						
1950-51	682	24	32·0	28	9	37
1965-66	1,087	31	12·4	40	5	45
1975-76	2,100	35	20·0	73	14	87
1985-86	2,875	35	20·0	99	20	119
Lower Secondary Education (General)						
1950-51*	1,258	25	44·8	50	23	73
1965-66*	1,959	25	37·0	78	29	107
1975-76	3,150	25	33·3	152	51	203
1985-86	4,150	25	33·3	201	67	268
Lower Secondary Education (Vocational						
1950-51**	1,705	16	86·8	106	92	197
1965-66**	2,887	15	100·0	208	208	417
1975-86	..	..	..	..	..	500
1965-86	..	..	..	..	..	600
Higher Secondary Education (General)						
1975-76	4,500	20	33·3	272	91	363
1985-86	5,500	20	33·3	333	111	444
Higher Secondary Education (Vocational)						
1975-76	..	..	..	..	..	700
1985-86	..	..	..	..	..	800

*High/Higher Secondary Schools.

**All types of vocational and technical schools.

Note.(i) The costs for the years 1950-51 and 1965-66 are at current prices and for those 1975-76 and 1985-86 are at constant prices of 1965-66.

(*ii*) For details, see Supplemental Note II at the end of the chapter.

(*iii*) Totals do not tally on account of rounding of figures.

19.33. We would specially invite attention to the following implications of these estimates:

(1) *Total Expenditure on School Education.* The total expenditure on school education is expected to increase from Rs. 4,046 million (or 67·4 per cent of the total expenditure) in 1965-66 to Rs. 11,262 million (or 72·4 per cent of the total expenditure) in 1975-76, and Rs. 26,588 million (or 65·9 per cent of the total expenditure) in 1985-86.

(2) *Capital Expenditure on School Education.* The bulk of this expenditure will be recurring. The capital expenditure on school education will increase from Rs. 133 million or 2·2 per cent of the total expenditure) in 1965-66 to Rs. 389 million or 2·5 per cent of the total expenditure) in 1975-76, and to Rs. 1,009 million (or 2·5 per cent of the total expenditure) in 1985-86.

(3) *Pre-Primary Education.* The average annual salary of teachers is expected to rise from Rs. 1,000 in 1965-66 to Rs. 1,800 in 1975-76 and Rs. 2,500 in 1985-86. The pupil-teacher ratio is proposed to be raised from 31 in 1965-66 to 40. The average annual cost per student which was Rs. 55 in 1965-66, would be raised to Rs. 74 in 1975-76, and Rs. 103 in 1985-86. It will be noticed that the cost per student is higher at the pre-primary stage than at the primary stage because of the need to provide meals and other health services.

(4) *Lower Primary Education.* The average annual cost per student was only Rs. 20 in 1950-51 and it rose to Rs. 30 in 1965-66 (at current prices). If allowance is to be made for increase in prices, there would be an actual fall. What is now proposed is to raise this cost substantially, at constant prices, to Rs. 52 in 1975-76 and to Rs. 80 in 1985-86.

It should be remembered that, at this level of expenditure, all that is possible is to provide free books to all children and the necessary contingencies to primary schools. No provision has been made in these estimates for school meals, school uniforms or health services. The average annual salaries of teachers will rise from Rs. 1,046 in 1965-66 to Rs. 1,800 in 1975-76 and Rs. 2,500 in 1985-86. This, we regard, is the minimum essential. The pupil-teacher ratio is proposed to be raised from 38 in 1965-66 to 50 in 1975-76 by the adoption of the three-hour session system. This is inescapable if a living wage is to be given to the primary teachers. If smaller classes are considered desirable, either additional funds will have to be found or the rate of expansion will have to be deliberately slowed down.

It may be incidentally pointed out that the average class-size in compulsory primary education bears a definite proportion to the effective birth-rate (*i.e.*, children per thousand of population entering the age-group 5-6 when admission to primary school begins). In other words, class-size (on the assumption that the salary of a primary school teacher is 3 to 4 times the per capita GNP) in compulsory education generally lies between 1.5 and 2.0 times the effective birth-rate. When the birth-rate in India falls down to somewhere between 15-20, it will be easily possible to reduce the class-size to somewhere between 30 and 35. But smaller class-sizes at the present level of birth-rate will be costly and beyond the economic capacity of the country.

It should also be emphasized that we have provided 10 per cent of the primary schools at optimum levels of quality, *i.e.*, at about twice the cost per pupil than in the average school. It will be possible to maintain these schools at a level of efficiency of the next higher stage, *i.e.*, higher primary education and to provide them with trained graduates as headmasters and larger grants for non-teacher expenditure.

(5) *Higher Primary Education.* The general picture at this stage is similar to that at the lower primary stage.

We expect the headmasters of these schools to be trained graduates (it has been assumed that there would be one trained graduate to three other teachers) and hence the average annual salary of a teacher is a little higher than that at the lower primary stage.

The pupil-teacher ratio is proposed to be raised from 31 to 35 and maintained at that level.

The cost per pupil will rise from Rs. 45 to Rs. 87 by 1975-76 and still further to Rs. 119 by 1985-86 (at 1965-66 prices).

As at the primary stage, provision has only been made for free supply of books and contingencies and there is no provision for school meals, uniforms or health services.

It has been assumed that 20 per cent of the total enrolment would be in part-time courses.

(6) *Lower Secondary Education.* The average annual salary of teachers which stood at Rs. 1,959 in 1965-66 is proposed to be increased to Rs. 3,150 by 1975-76 and Rs. 4,150 by 1985-86. The pupil-teacher ratio remains unchanged at 25. The cost per pupil which rose from Rs. 73 in 1950-51 to Rs. 107 in 1965-66 (at current prices) is expected to rise, at constant prices, to Rs. 203 in 1975-76 and to Rs. 268 in 1985-86.

(7) *Higher Secondary Education.* At this stage, the average annual salary of teachers will be Rs. 4,500 in 1975-76 and Rs. 5,500 in 1985-86. The pupil-teacher ratio has been assumed at 20. The cost per student is expected to rise to Rs. 363 in 1975-76 and to Rs. 444 in 1985-86.

(8) *Vocational Education.* Provision has been made for vocational courses both at the lower secondary and higher secondary stages as recommended in the relevant chapters of the Report. The cost per pupil has been assumed on an *ad hoc* basis. To be accurate, it will be necessary to cost each vocational course separately. But the necessary data for this were not available to us.

(9) *Quality Institutions.* As at the lower primary stage, provision has been made to maintain about 10 per cent of the institutions at each stage at optimum levels of efficiency. In other words, it is assumed that in 10 per cent of the institutions at each stage, the cost per pupil will be about double that in the ordinary schools at that stage.

The levels of expenditure per pupil given above certainly mark a great improvement over the existing situation. But they are, by no means, what can be wished for. It is, however, evident that these are probably the highest levels of expenditure which we might be able to afford.

19.34. **Higher Education.** We must confess that in the case of higher education it is even more difficult to prepare reliable estimates and forecasts of costs. All the same, we have made a tentative exercise in costing the programme of higher education for 1975-76 and 1985-86 at the constant prices of 1965-66. The details, as stated earlier, will be found in Supplemental Note III at the end of this chapter. Its main conclusions are shown in Tables 19.13 and 19.14.

TABLE 19.13. EXPENDITURE ON HIGHER EDUCATION (1975-76 to 1985-86)

Type of education	Total expenditure (Rs. in 000's)		Percentage of total expenditure	
	1975-76	1985-86	1975-76	1985-86
1. *Recurring (Direct)*				
Undergraduate				
Arts & Commerce	453,516	974,963	2·9	2·4
Science and Vocational	1,439,250	3,264,000	9·2	8·1
TOTAL	1,892,766	4,238,963	12·2	10·5
Postgraduate				
Arts & Commerce	304,200	1,106,400	1·9	2·7
Science and Vocational	820,000	2,937,000	5·3	7·3
TOTAL	1,124,200	4,043,400	7·2	10·0
Total Recurring (Direct)	3,016,966	8,282,363	19·4	20·5
2. *Recurring (Indirect)*				
Scholarships	628,200	2,416,200	4·0	6·0
3 *Total Recurring (Direct and Indirect)*	3,645,166	10,698,563	23·4	26·5
4. *Capital*				
Buildings and Equipment	576,855	2,673,486	3·7	6·6
TOTAL (Higher Education)	4,222,021	13,372,049	27·1	33·1

N. B. Totals do not tally due to rounding of figures.
For details, see Supplemental Note III at the end of the chapter.

TABLE 19.14. AVERAGE ANNUAL COST PER PUPIL IN HIGHER EDUCATION (1950-51 to 1985-86)

Type of institution	Average annual salary per teacher	Number of pupils per teacher	Percentage of non-teacher costs to teacher costs	Average annual cost per pupil		
				Due to teacher costs	Due to non-teacher costs	Total
	Rs.			Rs.	Rs.	Rs.
Undergraduate						
(*a*) *Arts and Commerce*						
1950-51*	2,696	20	73·7	133	98	231
1965-66*	4,000	20	63·8	200	128	328
1975-76	6,000	15	66·7	440	293	733
1985-86	7,500	15	66·7	550	367	917
(*b*) *Science and Vocational*						
1950-51**	3,948	11	118·1	357	422	779
1965-66**	6,410	11	100·0	584	583	1,167
1975-76	..	..	..	..	..	1,500
1985-86	..	..	..	..	..	2,000
Postgraduate						
(*a*) *Arts and Commerce*						
1975-76	10,000	8	118	1,375	1,625	3,000
1985-86	12,000	8	118	1,650	1,950	3,600
(*b*) *Science and Vocational*						
1975-76	..	..	..	..	..	5,000
1985-86	..	..	..	..	..	6,000

*All types of Colleges for Arts & Science (Intermediate to Postgraduate).

**All types of Vocational/Professional Colleges.

N.B. For details, see Supplemental Note III at the end of the chapter. Some actual costs per student in a few universities and colleges are given in Supplemental Note IV at the end of the chapter.

19.35. The following comments about table 19.14 are in order. We have assumed that—

(1) at the undergraduate stage, the cost per student will be Rs. 733 for about 40 per cent of the enrolment (in arts and commerce courses) and Rs. 1,500 for 60 per cent of the enrolment (in quality institutions in courses in arts and commerce and in science and vocational courses) in 1975-76. For 1985-86 the corresponding figures would be Rs. 917 and Rs. 2,000 respectively. Even these costs will be possible in full-time education only if at least 30 per cent of the total enrolment is in courses of part-time and correspondence education.

(2) at the postgraduate stage, the cost per student will be Rs. 3,000 for about 40 per cent of the enrolment

(in arts and commerce courses) and Rs. 5,000 for the remaining 60 per cent of the enrolment (in quality institutions in arts and commerce and in science and vocational courses) in 1975-76. The corresponding figures for 1985-86 would be Rs. 3,600 and Rs. 6,000 respectively. As at the undergraduate stage, these expenditures would be possible in full-time postgraduate education if at least 30 per cent of the enrolment is provided for in part-time and correspondence courses.

(3) The funds available for capital expenditure are far from adequate, especially in the next few years. Ordinarily, about 20 to 25 per cent of the total expenditure on higher education should be available for buildings and major equipment. Instead of this, only 15·8 per cent of the total expenditure on higher education will be available for capital programmes in 1975-76. Fortunately, the position improves by about 1985-86 when the proportion of capital expenditure rises to about 25 per cent.

19.36. From the data we have been able to collect regarding cost per student in institutions of higher education which are known to maintain good standards, it appears that this order of expenditure per student will be far from adequate. At the undergraduate stage, we broadly require an expenditure of the order of Rs. 1.000 per student; and if 10 per cent of the institutions are to be maintained at optimum levels of quality, *i.e.*, at about ten times the cost per pupil, the average cost per student at the undergraduate stage will have to be about Rs. 2,000. The capital cost at this stage will be about Rs. 5,000 per student. At the postgraduate stage, a capital expenditure of the order of about Rs. 25,000 to Rs. 30,000 per student is needed and the recurring cost will have to be as high as Rs. 6,000 to Rs. 7,000 per student. As at the undergraduate stage, this expenditure also would be doubled if 10 per cent of the institutions are to be maintained at optimum levels of quality *i.e.*, at about ten times the cost per student. It is thus obvious that if an earnest attempt is to be made to maintain adequate levels of quality in higher education and to raise at least a few institutions to international standards, we will have to find large additional resources. If that is not possible, we shall have to come to grips with difficult problems of the following type:

(1) Would it be possible to reduce the total enrolment in higher education? This will involve the consideration of a number of problems such as relating the output of educational institutions to forecasts of manpower needs; improving organization and administration in the public and private sectors to ensure that every educated person is fully and properly utilised; reducing unemployment among the educated; increasing the participation rates among the educated persons; revising the present policies which are based on 'over education' *e.g.*, educating an engineer and using him for jobs which can really be done by technicians; etc.

(2) Would it be possible to reduce the number of places to be provided in full-time education so that a larger expenditure per place could be incurred? This will involve a serious attempt to expand part-time and correspondence education and to provide these facilities to about 50 per cent of the total enrolment as is done at present, for instance, in the USSR.

(3) Would it be possible to economise the expenditure in terms of physical and financial investment without affecting standards? This will involve problems of intensive utilization of existing facilities; cooperative use of costly equipment by a number of institutions; manufacture of equipment in the country itself; etc.

These and other problems of this type are as important as they are difficult. At the moment we run away from them by diluting standards and maintaining the expenditure per student at low levels—a device which provides an easy escape valve. In any attempt to raise standards and the expenditure per pupil, these problems will have to be squarely faced and resolutely tackled.

19.37. **Adult Education.** Our proposals for the development of adult education (including liquidation of adult illiteracy) are given in Chapter XVII. For these programmes, we propose an increasing provision which will rise to about Rs. 78 million a year (or 0·5 per cent of the total expenditure) in 1975-76 and Rs. 404 million a year (or 1·0 per cent of the total expenditure in 1985-86.

19.38. **Total Expenditure.** Table 19.15 gives the total estimated expenditure—recurring as well as capital—on all stages and sectors of education for 1975-76 and 1985-86.

TABLE 19.15. EDUCATIONAL EXPENDITURE BY OBJECTS IN INDIA (1975-76 and 1985-86)

Object	Total expenditure (Rs. in 000's)		Percentage of total expenditure	
	1975-76	1985-86	1975-76	1985-86
Recurring				
Pre-Primary	236,956	488,531	1·5	1·2
Lower Primary	3,749,220	6,129,616	24·1	15·2
Higher Primary	2,451,567	5,140,287	15·8	12·7
Lower Secondary	2,432,310	7,072,638	15·6	17·5
Higher Secondary	1,312,336	3,643,549	8·4	9·0
Direction and Inspection	389,050	1,614,560	2·5	4·0
Scholarships	301,680	1,490,240	1·9	3·7
TOTAL (SCHOOL)	10,873,119	25,579,421	69·9	63·4
Undergraduate	1,892,766	4,238,963	12·2	10·5
Postgraduate	1,124,200	4,043,400	7·2	10·0
Scholarships	628,200	2,416,200	4·0	6·0
TOTAL (HIGHER EDUCATION)	3,645,166	10,698,563	23·4	26·5
Adult Education	77,810	403,640	0·5	1·0
TOTAL (RECURRING)	14,596,095	36,681,624	93·8	90·9
Capital				
School education	389,050	1,008,890	2·5	2·5
Higher education	576,855	2,673,486	3·7	6·6
TOTAL CAPITAL)	965,905	3,682,376	6·2	9·1
GRAND TOTAL	15,562,000	40,364,000	100·0	100·0

Note. Totals do not tally due to rounding of figures

SOME GENERAL OBSERVATIONS

19.39. Whatever the assumptions one might make regarding the growth of national income or the proportion of GNP to be allocated to education, it is evident that, in the foreseeable future, it will not be possible to provide monetary resources for education which can compare with what is being done in the industrialized countries. We have assumed that the total educational expenditure would rise, at constant prices, from about Rs. 12 per capita in 1965-66 to about Rs. 54 per capita in 1985-86. But even this can bear no comparison to the level of educational expenditure already reached in some industrialized countries. For instance, this expenditure is about Rs. 244 (11,700 yen) in Japan, Rs. 295 (193.63 francs) in France; Rs. 378 (45.35 roubles) in the USSR; Rs. 515 (£ 24.55) in the UK and Rs. 1,175 (156.73 dollars) in the USA.[1] The gulf between these levels of educational expenditure and ours is and will continue to be so wide that we cannot hope to solve our problems by the mere adoption of the techniques of the industrialized countries.

19.40. In a situation of this type, we can hope to obtain optimum results only if we adopt action on two lines. The first is that we should strive to allocate the largest proportion of GNP possible to educational development. Since additional resources are generated largely through the process of economic growth, the fact that education tends to augment the flow of national product, though with some time-lag, is of crucial importance. It follows, therefore, that in the long run education to some extent is self-financing because the increased incomes generated by a relatively better educated labour force would provide resources for greater allocations to education.

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[1] All figures are for 1962. The conversion into rupees has been done at the post-devaluation rates of exchange.

19.41. The second is the need to realize the simple but elementary point that it is impossible to create an educational system which would meet the individual and national needs if conventional techniques, existing practices of under-utilization and wastage were to continue. It would, therefore, be necessary to make every rupee go the longest way possible by adopting measures for economy, for reduction of wastage, and for intensive utilization. These should receive the greatest emphasis and the most earnest consideration. The manner in which this can be done has been indicated in the appropriate context in earlier chapters. Even at the risk of some repetition, however, we would enunciate a few of the points which are significant from the financial point of view:

(1) The utmost economy possible should be practised in the construction of buildings.

(2) The cost of equipment could be reduced considerably by better designing, large-scale production, improvisation and careful handling to increase its life.

(3) Techniques in which certain facilities could be shared in common by a group of schools (*i.e.* a circulating library for rural primary schools) should be encouraged and adopted on a large-scale.

(4) Where equipment and facilities become costly and sophisticated, they should be intensively and cooperatively utilized for the largest part of the day and throughout the year.

(5) Whenever possible, educational buildings should be put to use for as long as possible in the day and wherever needed, at night as well.

(6) Larger classes and higher pupil-teacher ratios are inevitable for some years to come, and it would only be a disservice to education to adopt the practices of affluent societies in this regard. In a developing economy, we must accept these as facts of life and meet their challenge through the development of appropriate techniques and hard work.

(7) There is no justification for the continuance of the large wastages which now prevail at every stage. Their reduction should be a definite national target and to that end, programmes for the active involvement of each individual institution in the process should be encouraged. This is the only way to meet the situation.

(8) The working day should be longer and the number of working days should be increased. The vacations should be utilised as fully as possible and designated as vacation 'terms'.

(9) Programmes of part-time and own-time education should be organized on as large a scale as possible to meet the increasing demand for education from workers as well as from those who cannot be provided with a place in full-time institutions.

(10) The education of the gifted children should be attended to on a top priority basis.

(11) With a view to raising quality all round and in all institutions in the shortest time possible, it is essential to concentrate resources, in the immediate future, on the development of some centres of excellence and quality institutions at all stages of education, particularly in secondary and higher education. This programme should be given a very high priority.

(12) Places in full-time institutions of secondary and higher education should be provided with due regard to manpower needs and maintenance of standards; and admissions to them should be made on the basis of an egalitarian selection.

(13) Sectors of education which have a multiplying effect like postgraduate studies or teacher education or those which have a direct relationship

with an increase in productivity such as agricultural and technical education, or those which tend to decrease wastage or intensify utilization.

(14) Wasteful expenditure which often arises from rigidities of administrative and financial procedures should be avoided by introducing flexibility and adequate decentralization of authority.

(15) Greater emphasis should be placed on programmes which need more of human talent, dedication and hardwork (such as preparation of textbooks, teaching and learning aids, research, etc.) than on those which involve large investment of physical and financial resources.

(16) A vigorous attempt should be made to establish institutions of optimum size at all levels of education because these would be more efficient and less costly.

19.42. Since an underdeveloped economy cannot aspire to match the levels of per capita educational expenditure of the developed ones, the problems of educational reconstruction in India can be tackled only on the basis of an approach which meets our special situation. A mere imitation of some of the techniques and programmes of education in developed societies will not meet our requirements. The complexity of our problems, and the necessity of connecting education with life, particularly productivity, have to be identified and solutions worked out which take care of the specific needs of the country. It is our firm view that while a careful study of major educational developments in other countries is essential to enable us to draw upon their experiences, there is no substitute for original, hard and serious thinking involved in a sustained and serious effort to make our meagre resources go the longest way possible.

19.43. This implies emphasis on research in all sectors of education. Our general proposals for the development of educational research have been discussed elsewhere[1]. Here, we would only highlight the need to conduct research in the problems of economics and financing of education which are only just receiving the attention of economists and educationists in our country. Among other things, there is urgent need to examine continually the relationship between cost and quality and to develop programmes which would obtain the highest possible quality for a given level of input (or minimize inputs for a given level of quality). We recommend that the UGC should provide financial support for the development of such studies in a few selected universities and that a similar programme for the school stage should be developed in the NCERT and the State Institutes of Education.

19.44. The estimates of total educational expenditure given above are admittedly tentative. As we have emphasized, extensive research is needed on the study of unit costs and educational productivity. In the light of these studies, these estimates will have to be continually revised. Moreover, it is likely that they will be attacked on both sides. On the one hand, some persons would argue that they are on the low side and that they will have to be upgraded substantially if education of the appropriate quality and in adequate quantity is to be provided. On the other hand, they will also be attacked on the ground that they are over-ambitious and unrealistic. What is important, however, is that a national system of education on the lines indicated in the Report is organized without delay and an earnest effort is made to provide all the needed resources for the purpose. In doing so, of course, many hard choices will have to be faced and risks taken. But in an age of science, there can be no greater risk than a policy of drift and niggardliness in education.

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[1] Chapter XII.

NEED FOR VIGOROUS AND SUSTAINED IMPLEMENTATION

1. In the last eighteen years, there have been two Commissions and a large number of Committees appointed by the Government of India which have reported on different aspects of education. In addition, there have also been a large number of Committees appointed by the State Governments whose reports are of local as well as of national significance. Moreover, numerous advisory bodies have made innumerable recommendations on almost every aspect of education. All the same, the development of education in the post-independence period leaves much to be desired; and as the Government Resolution appointing this Commission has pointed out, 'a wide and distressing gulf continues to persist between thought and action and programmes concerning the quality of education, even when these were well-conceived and generally agreed to, could not be implemented satisfactorily.' It is this aspect of the problem that should be our major concern.

2. We would like to emphasize that there is no place for half-hearted policies in the days ahead. The economic prosperity of the country, the social and national cohesion of its life, the level of its cultural and spiritual development, its place in the comity of nations and its contribution to the life of Man—all these depend upon the quality of men and women we have; and this, in its turn, depends essentially upon the education we provide. Educational reconstruction is thus crucial for our future and extremely urgent (it has to be completed within the life-span of a generation at the most). It is also unusually difficult because it has to be accomplished with comparatively meagre resources in terms of men, materials and money. In spite of these difficulties, it has to be taken up in earnest immediately and pursued intensively. We stand at a critical cross-roads of history where the choice is between education and disaster. We must either build a sound, balanced, effective and imaginative educational system to meet our developing needs and respond to our challenging aspirations or be content to be swept aside by the strong currents of history.

3. **Essentials for Successful Implementation.** A vigorous and sustained implementation of the recommendations made in the Report demands a higher priority than that given so far to education in our national plans for development. A deliberate commitment about the crucial role of education in national development can alone provide the psychological motivation and energy needed for a massive programme of implementation. We realize that such conviction will depend essentially upon the extent to which education is effectively and demonstrably related to the life, needs and aspirations of the country. This is a task mainly for the educators, and it is the urgency of this that we have emphasized in the Report.

4. Equally essential is the need for dedicated hard work. Today, the nation is facing, as never before, the challenge of hunger, unemployment, ill-health and poverty. A vital element which would help the country to meet this challenge is a revitalized education which, in its turn, can only be created if the leaven of idealistic teachers and administrators exists. Idealism is needed, now more than ever, in all walks of life and especially in education. It may not be easy to plan for it; but it is doubtful if anything worthwhile will be achieved if we cannot generate it in fair measure.

5. Education thus needs and demands, more than anything else, hard work and dedicated service. In particular, it presents a supreme challenge to the students, teachers and educational administrators who are now called upon to create a system of education related to the life, needs and aspirations of the people and to maintain it at the highest level of efficiency. It is upon their response to this challenge that the future of the country depends.

6. We have emphasized that educational and national reconstruction are intimately interrelated and that perhaps the most effective way of breaking the vicious circle in which we find ourselves at present is to begin educational reconstruction in a big way. We would, however, like to point out that it will not be possible to make much headway in education unless the basic problems of life are also squarely faced and resolutely tackled. This stresses the interlinking of education and national development.

7. Finally, we would like to emphasize three points which are obvious but generally tend to be ignored:

- The Report of a Commission is not a substitute for action. Its purpose is to generate action. A Report which is shelved or does not lead to action is worse than no Report because it leads to frustration by arousing hopes that remain unfulfilled.
- Time is the essence of the problem. The next few decades are crucial and the future of the country depends largely upon what is done about education during the next ten years or so. The decisions on the several recommendations made in this Report need to be taken quickly. Action must start forthwith and continue at an ever increasing pitch of intensity in the years to come.
- The responsibility of implementing the Report is primarily that of the Government—Central and States. If they will not accept it, no one else will or can.

The stakes are too big to be taken lightly. We trust that to this tremendous challenge, there will be an adequate response.

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JEAN THOMAS
J. P. NAIK
J. F. MCDOUGALL

NEW DELHI
29TH JUNE, 1966

Now that the work of the Commission has been completed we should like to say what a privilege it has been to have been associated with it. In particular, we wish to express our appreciation of the generosity of spirit with which our collaboration has been welcomed, not only by our fellow-members but by everyone with whom the work has brought us into contact. We would like to think that just as the invitation to us was an expression of the international-mindedness of India, so our participation may be taken as a sign of the goodwill of other countries towards India. We realise that to carry out the recommendations of the Report will be difficult and will call for great resolution; but we have confidence that their acceptance and implementation will lead to a decisive step forward in the education and the well-being of the Indian people.

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SUPPLEMENTAL NOTE I

GRANT-IN-AID FROM STATE GOVERNMENTS TO LOCAL AUTHORITIES—URBAN AND RURAL: CENTRAL-STATE RELATIONSHIP IN FINANCIAL SUPPORT TO EDUCATION

1. We have recommended that the administration of school education in a district should be transferred to District School Boards and that in areas of bigger municipalities to Municipal School Boards.[1] We have further suggested that even smaller municipalities should be associated with the administration of education within their areas and be made to bear a certain portion of the expenditure thereon. In this note, we shall make a few suggestions regarding the manner in which grant-in-aid to these authorities, for educational purposes, shall be used to stimulate local contributions and thereby get larger revenues for education. Incidentally, we shall also discuss briefly the Centre-State relationship in the financing of education.

2. **Grants-in-Aid to District School Boards.** The zila parishads have an authority to levy a cess on land revenue for purposes of education. In this context, we recommend that the State should prescribe the minimum cess to be levied by a zila parishad and also authorize it to raise the same voluntarily up to a prescribed maximum. In order to stimulate the use of this authority, a grant-in-aid proportionate to the additional revenues thus raised should be guaranteed. A device of this type has been adopted in Maharashtra State and it is found that most of the zila parishads have raised the cess substantially. It is possible that a similar result may be obtained elsewhere also.

3. The existing system of grant-in-aid to local authorities needs revision. An analysis of the existing practices on the subject shows considerable variation. In some States, the grants are given on a deficit basis, and it is the general experience that, under this system, the politically important and vocal districts, rather than the needy or backward areas, get the most benefit and there is no incentive to economise. When 'proportional' grants are given as a percentage of the total expenditure, the richer districts tend to get larger grants: and innumerable problems arise regarding the 'approved' or 'admissible' expenditure. The 'block' grants tend to be inelastic and particularly unsuitable in a situation when expenditure in educaton is rising fast. On an overall view of the existing practices, therefore, we suggest that a reform of the grant-in-aid procedures in respect of zila parishads be carried out on the broad outlines indicated below:

(1) The grant-in-aid for the salaries and allowances of teachers and other administrative and supervisory staff sanctioned by Government should be on a 100 per cent basis; some definite rules should be prescribed regarding the basis on which the number of teachers required should be calculated (*e.g.*, on the basis of enrolment). The administrative and supervisory staff could be related to the number of teachers.

(2) For the non-teacher costs, a block grant per child in attendance should be given. The amount of this grant should be fixed separately for each category of schools and should be revised every three to five years.

(3) The resources raised locally by the zila parishad, as well as the State grant thereon, should be left with the zila parishad for such developmental programmes as it deems necessary.

(4) Grants-in-aid for non-recurring expenditure should be given separately, preferably at about two-thirds of the expenditure.

The major objective of the system of grant-in-aid to zila parishads should be to equalize educational opportunities. This should be kept in view while sanctioning the posts of teachers or deciding the recurring grant-in-aid per pupil or the proportion of the non-recurring grant to be given. Moreover, the amounts of grant-in-aid should be allowed to be funded and not made to lapse at the end of the financial year, as this encourages economy and a careful use of resources.

4. **Grant-in-Aid to Municipalities.** From the quantitative point of view, the municipal funds are even more important than the contributions of the zila parishads because they are growing rapidly on account

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[1] Chapter XVIII.

of industrialization, urbanization, and the increasing concentration of wealth in urban areas. In the erstwhile British Indian Provinces, the municipalities were made to pay for the support of primary education as early as in 1882. A tradition has thus grown up and we now find municipalities like Bombay spending a few million a year on primary education. On the other hand, in the erstwhile Princely States, the municipalities were not entrusted with primary education nor paid for it. Thus, even the big municipalities like Hyderabad, Bangalore or Gwalior make no contribution in support of primary education. There is no reason why the richer urban areas should be exempted from responsibility for education. We recommend that all municipalities should be compelled to pay for a portion of the cost of education in their areas by the levy of a cess on land and buildings. Even a minimum cess of two per cent of the annual letting value of real property in urban areas can secure a fair and increasing contribution to the support of education.

5. In devising a system of grants to municipalities for school education, it is essential to remember that the municipalities show an immense variation in their wealth and capacity to support education. For instance, a small municipality in a semi-rural township of 5 to 15 thousand population has a very limited capacity to raise funds in support of education compared with a big corporation like that of Bombay. It is, therefore, necessary to devise a system of grant-in-aid which will vary from one group of municipalities to another; and in our opinion, the best procedure would be to adopt a method under which the municipalities could be classified on the basis of their wealth and the poorer municipalities given a higher rate of grant-in-aid than the richer ones. This principle was enunciated, as early as in 1937, by the Kale Committee of the then Bombay State, and a good deal of experience in its implementation has been gained in the States of Gujarat and Maharashtra. This could be of considerable use to other areas adopting the programmes.[1]

6. The cases of the larger corporations like Bombay, Madras, Calcutta or Delhi, which form the wealthiest group among the municipalities, would have to be considered separately. At present, the position shows great variation. For the Bombay Corporation, the State Government gives a block grant which now stands at Rs. 6.8 million in a total educational expenditure of Rs. 54 million. In Calcutta, the corporation spends about Rs. 3.8 million and gets no grant-in-aid. In Madras, an identical grant-in-aid formula applies to all municipalities, from the smallest to the biggest. At present, the Government grant to the Madras Corporation is equal to Rs. 4.1 million in a total expenditure of Rs. 13.4 million. Several big corporations like Hyderabad have no financial responsibility at all in education. It would be desirable to make all corporations responsible at least for primary education and give them grant-in-aid on a proportional basis, i.e., at a certain percentage to be fixed for a corporation depending upon its resources. The same principle would apply to other large municipalities which have a School Board, the only difference being that the grant-in-aid would be generally at a higher percentage than that in regard to corporations.

7. The smaller municipalities will be able to contribute even less. By and large, they should be made responsible for all non-teacher costs (the teacher costs being borne fully by the State Governments) and should be required to meet them by the levy of a local cess on lands and buildings in their areas and a suitable grant-in-aid towards it given by the State Government, on an equalization basis.

8. **Equalization.** We have recommended grants-in-aid from the State Government to the zila parishads and the municipalities on the basis of equalization. It is necessary to explain this new concept of grant-in-aid which has been in successful operation in the USA for a number of years. The central concept of equalization is that, for a given local effort, the local authority must be able to reach a given level of expenditure per child. For instance, in the case of two municipalities—A and B—let us assume that

- the level of equalization in primary education has been fixed at a recurring expenditure of Rs. 50 per child per year;
- it has also been decided that each municipality should contribute, to the expenditure on primary education, at the rate of two per cent of the annual letting value of real property within its area; and
- this rate produces an income of Rs. 10 per child in municipality A and Rs. 20 per child in municipality B.

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[1] A similar recommendation was made by the Committee of Ministers constituted by the Central Council of Local Self-Government, 1963.

Under these circumstances, the grant-in-aid of the State Government to municipality A would be Rs. 40 per child and to municipality B, Rs. 30 per child.

9. **The Role of the Central Government in the Financing of Education.** It has been stated above that the contribution of 'Government funds' to total educational expenditure may have to be increased from the present level of 71 per cent to about 90 per cent.[1] This is the contribution of the Central and State Governments taken together. For a clarification of the position, however, it is necessary to discuss the contribution of the Central Government separately. The State Governments have the residual responsibility to finance education i.e. they must find all the funds required for education after allowance is made for contributions by the Central Government, the local authorities and other sources.

10. The Government of India gave special grants to the Provinces for educational purposes from 1870 (when authority over education was first decentralized to them) to about 1921. These were particularly large between 1902 and 1914 which was a period of comparative boom in the Central revenues. They were, however, discontinued in 1921 when education was transferred to Indian control in the Provinces. One of the outstanding events of the post-independence period is the resumption of assistance by Central Government for education and these have continuously increased during the first three plans. In addition, the Central Government has been incurring considerable direct expenditure on education. These two forms of Central financial support to education will have to be considered separately.

11. **Direct Central Expenditure on Education.** Table 19.16 shows the growth of direct central expenditure on education from 1950-51 to 1960-61, the latest period for which statistics of expenditure are available.

TABLE 19.16. EDUCATIONAL EXPENDITURE THROUGH CENTRAL GOVERNMENT FUNDS BY OBJECTS (1950-51 to 1960-61)

Type of Institution/Object	Expenditure on Education through Central Government Funds			
	Amount (Rs. in 000's)		Percentage of expenditure on the object to total expenditure from Central Govt. Funds	
	1950-51	1960-61	1950-51	1960-61
Direct Expenditure	Rs.	Rs.		
Pre-Primary Schools	..	187	..	0·1
Lower Primary Schools	468	17,943	1·3	6·1
Higher Primary Schools	308	11,914	0·9	4·0
Secondary Schools	2,229	6,412	6·3	2·2
Schools for Teacher Training	..	1,778	..	0·6
Schools for Vocational Education (excluding Teacher Training)	1,720	9,241	4·9	3·1
Schools for Special Education	104	1,087	0·3	0·4
Universities and Institutions for Higher Education	11,591	58,962	32·9	19·9
Colleges for Teacher Training	136	1,100	0·4	0·4
Colleges for Professional Education (excluding Teacher Training)	7,928	30,255	22·5	10·2
Colleges for Special Education	127	1,378	0·4	0·5
Total (Direct Expenditure)	24,611	140,259	69·8	47·4
Indirect Expenditure				
Direction and Inspection	..	673	..	0·2
Buildings	8,278	111,447	23·5	37·7
Scholarships and other financial concessions	1,769	32,478	5·0	11·0
Hostel charges	158	1,106	0·4	0·4
Miscellaneous	431	9,815	1·2	3·3
Total (Indirect Expenditure)	10,636	155,519	30·2	52·6
GRAND TOTAL	35,247	295,778	100·0	100·0

N. B. Totals do not tally due to rounding.

Source. Form A of the Ministry of Education, Government of India.

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[1] We expect that the balance of 10 per cent would be made by fees (3 p.c.), contribution of local authorities (4 p.c.) and voluntary contributions and donations from the people (3 p.c.).

It will be seen that the total educational expenditure from the funds of the Central Government has increased from Rs. 35 million in 1950-51 to Rs. 296 million in 1960-61 which implies an average annual increase of 23.7 per cent which is considerably greater than that in the total educational expenditure which increased at an average annual rate of 11.7 per cent only. It will be seen further that the bulk of the Central expenditure on education is incurred on higher education and on buildings and scholarships which are also mostly meant for higher education only. This is in keeping with the constitutional responsibility of the Government of India to coordinate and maintain standards in higher education.

12. In the third plan, Central expenditure on education increased still further at about 18 per cent per year as shown below. Its detailed distribution over different sectors is not available.

TABLE 19.17. BUDGETED CENTRAL EXPENDITURE ON EDUCATION IN THE THIRD PLAN

Year	Budgeted Expenditure of the Government of India (excluding grants to States) (Rs. in 000's)
1961-62	333,428
1962-63	459,636
1963-64	428,794
1964-65	617,938
1965-66	756,194

13. In the days ahead, the Centre will have to assume a still larger financial responsibility for education through the expansion of the Central sectors. Our proposals on this subject have been detailed in the appropriate context in the earlier chapters of this Report. By way of reference, we give below some of the programmes which we have recommended for inclusion in the Central sector.

(1) Expansion of the programme of national scholarships;

(2) Expansion of the programmes of scholarships for the backward classes;

(3) Larger allocations to the UGC for

— development of Centres of Advanced Study and major universities;

—developing Schools of Education in a few selected universities;

—developing postgraduate education and research;

—provision of maintenance grants to State universities;

—establishment of the Central Testing Organization; and

— development of literature in modern Indian languages.

(4) Development of agricultural, engineering and medical education.

(5) Promotion of educational research.

14. **Central Grants to States for Education.** The Central grants to States under the awards of the Finance Commission are not discussed here because they are not earmarked for education. It is only the developmental grants given under the five-year plans that are so earmarked and the data about these are given in Table 19.18.

TABLE 19.18. EXPENDITURE ON EDUCATION (REVENUE ACCOUNT) FROM CENTRAL AND STATE GOVERNMENT FUNDS (1951-52 to 1965-66)

(Rs. in millions)

Year	Revenue expenditure on education			Combined revenue expenditure of the Centre States & Union Territories	Grant-in-aid from Centre to States (col. 4 *minus* col. 5)
	Centre	States & Union Territories	Total (Centre & States) including grants		
1	2	3	4	5	6
1951-52	40·8	602·8	643·6	641·3	2·3
1952-53	33·2	688·0	721·2	714·4	6·8
1953-54	43·0	757·5	800·5	785·8	14·7
1954-55*	24·3	859·6	883·9	899·7	—15·8
1955-56	142·3	1,037·9	1,180·2	1,104·3	75·9
1956-57	194·4	1,142·4	1,336.8	1,134·2	202·6
1957-58	209·8	1,304·4	1,514·2	1,477·6	36·6
1958-59	278·9	1,472·4	1,751·3	1,634·7	116·6
1959-60	366·9	1,709·0	2,075.9	1,897·0	178·9
1960-61	437·9	1,954·1	2,392·0	2,152·2	239·8
1961-62	513·3	2,344·8	2,858·1	2,604·0	254·1
1962-63	500·2	2,505·9	3,006·1	2,788·3	217·8
1963-64	570·8	2,833·3	3,404·1	3,138·1	266·0
1964-65 (Revised Estimates)	741·0	3,293·6	4,034·6	3,693·3	341·3
1965-66 (Budget Estimates	880·4	3,759·8	4,640·2	4,268·2	372·0

Source. Indian Economic Statistics, Part II, Public Finance, issued by the Ministry of Finance.

Note. 1. The figures relate to expenditure on education through the Ministry of Education only and exclude the expenditure on education incurred by other Ministries and Departments.

2. *The figures for 1954-55 seem to be wrong. As the details are not available, these could not be reconciled.

15. **The Centrally Sponsored Sector.** These grants can be sub-divided into two sub-categories: (1) grants-in-aid for schemes included in the State plans; and (2) grants-in-aid under the Centrally-sponsored sector. We do not propose to discuss the first category which forms a part of the Central assistance to the State plans as a whole and whose quantum and character vary from plan to plan. We are particularly concerned with the second category, namely, grants-in-aid under the Centrally-sponsored sector. It will be recalled that we have recommended a large expansion in the Centrally-sponsored sector and that the following are some of the schemes to which we have recommended aid under this sector:

(1) Training of teachers;

(2) Introduction of vocational education at the secondary stage;

(3) Development of the State Institutes of Education;

(4) Production of literature for children and teachers; and

(5) Development of quality institutions at the school stage.

Other programmes of a similar type which can be assisted have been indicated in the appropriate context in the different parts of the Report.

16. Some problems relating to the administration of the Centrally-sponsored sector need attention. In this context, we make the following recommendations:

(1) In selecting programmes to be included in Centrally-sponsored sector the State Governments should be consulted.

(2) One criterion for including programmes in the Central sector is that they should be of crucial importance and national in character. Programmes which need the adoption of a common policy in all parts of the country should preferably be included in the Centrally-sponsored sector.

(3) The local needs of the States vary considerably. It would, therefore, be desirable to include, in the Centrally-sponsored sector, some programmes which may vary from State to State. One method of doing so would be to divide the total funds available in the Centrally-sponsored sector into two parts, about half of them being allocated to national programmes which are referred to above. The other half should be made available to the State Governments, on some equitable basis, and they should be free, with the approval of the Government of India, to use them for any scheme which is significant and urgent in their local situation.

(4) The assistance to Centrally-sponsored schemes generally continues for the plan period. Very often it is not possible to start new Centrally-sponsored schemes in the beginning of the Plan; and if they are started late, the State Governments are unwilling to accept them because they would not get full financial assistance. It would, therefore, be desirable to make Central assistance for Centrally-sponsored schemes available to the States, on a five year basis rather than on the basis of a plan period. For some important schemes in the Centrally-sponsored sector, assistance may even be continued for a longer period, say, 10 years.

SUPPLEMENTAL NOTE II

TENTATIVE ESTIMATES OF EXPENDITURE ON THE DEVELOPMENT OF SCHOOL EDUCATION (1966-85)

1. The object of this note is to give a tentative estimate of expenditure on school education—recurring and capital. The estimate is attempted for two years only—1975-76 and 1985-86.

PRE-PRIMARY EDUCATION

2. The proposals for the development of pre-primary education have been detailed in Chapter VIII.

3. The estimated enrolments at this level would be the following:

(a) In 1965-66, the enrolment in pre-primary education proper was 250,000. We expect this to rise to 0·5 million in 1975-76 and to 2·4 million in 1985-86.

(b) The enrolment in the second category (*i.e.*, Class I of those States where the school course is of 11 years up to the matriculation and in Infant A and B of Assam and Nagaland) was 11·5 million in 1965-66. But this contains, not only children in the age 5-6, but also some children below five and a large proportion of those who are above six. The attempt to be made in future is to introduce the system of pre-registration, *i.e.*, this class will admit children only of 5. At the same time, all older children will be promoted to regular Class I of the primary school. As this process goes on, more and more children in the age-group 5-6 will come in (the target to be reached by 1985-86 being 50 per cent of the age-group 5-6) and older children will go up to Class I. As the two processes will be simultaneous, we have assumed that the enrolments at this level will be constant at 10 million each in 1975-76 and 1985-86. The break-down of this enrolment will be as follows:

(in 000's)

	1965-66	1975-76	1985-86
Pre-Primary Proper : Age-group 3—5	250	513	2,352
Pre-Primary (Other types) : Age group 5—6 .	11,523 (contains a large part of overage children)	9,487 (contains overage children)	7,648 (About 50 per cent of the age-group 5-6)
TOTAL	11,773	10,000	10,000

4. The cost of pre-primary education proper is estimated as follows:

	1975—76	1985—86
(1) Average annual salary of a teacher (Rs.)	1,800	2,500
(2) Add 10 per cent for retirement benefits (Rs.)	180	250
TOTAL (Teacher Costs) (Rs.).	1,980	2,750
(3) Non-teacher costs at one-half of the above (Rs.)	990	1,375
TOTAL COST (Rs.).	2,970	4,125
(4) Pupil-teacher ratio (Rs.)	40	40
(5) Cost per pupil (Rs.)	74·3	103·1

5. For other types of pre-primary education, cost has been assumed at Rs. 20 per pupil for 1975-76 and Rs. 30 per pupil for 1985-86.

6. The total recurring cost of the programme would thus be:

		1975-76 (Rs. in 000's)	1985-86 (Rs. in 000's)
(1) State level Centres	@Rs. 100,000 per centre	1,600	1,600
(2) District level Centres	@Rs. 50,000 per centre (150 in 1975-76 and 300 in 1985-86)	7,500	15,000
(3) Pre-primary education of the standard type		38,116	242,491
(4) Pre-primary education—other types		189,740	229,440
TOTAL		236,956	488,531

LOWER PRIMARY EDUCATION

7. At this level, we have recommended a pay scale of Rs. 150—250 with a selection grade rising to Rs. 300. The average of this scale by 1975-76 will be Rs. 1,800 (as against Rs. 1,046 in 1965-66) and Rs. 2,500 for 1985-86.

8. The non-teacher expenditure per student (which is only Rs. 3 at present) will have to be increased to Rs. 12 by 1985-86 as follows:

	Rs.
(1) Free supply of books and writing materials	5
(2) Equipment (at Rs. 30 per student with an average estimated life of 10 years)	3
(3) Contingent expenditure	4
TOTAL	12

We have assumed that it would be possible to raise the cost to about Rs. 8 per child by 1975-76 and to about Rs. 12 per child by 1985-86.

9. We have suggested a pupil-teacher ratio of 40 with an upper limit of 50 for each class. During the next ten years, however, larger classes would be inevitable. We, therefore, suggest the adoption of the three-hour session system in Classes I and II. As more resources become available, it may be gradually discontinued. This will enable us to have a pupil-teacher ratio of 50 by 1975-76 which will be reduced to 45 by 1985-86.

10. We have also recommended that 10 per cent of the schools should be upgraded to the optimum standard, (*i.e.*, to about double the cost per pupil).

11. The objective at this stage is to provide universal full-time education to all children. The enrolments on this basis have been detailed in Chapter VII.

12. On these assumptions the cost per student at the lower primary stage would be as follows:

	1975-76	1985-86
(1) Average annual salary of a teacher (Rs.)	1,800	2,500
(2) Add 10 per cent for retirement benefits (Rs.)	180	250
TOTAL (TEACHER COSTS) (Rs.)	1,980	2,750
(3) Non-teacher costs (*Rs. 8 per pupil in 1975-76 and Rs. 12 per pupil in 1985-86*)	400	540
TOTAL COST (Rs.)	2,380	3,290
(4) Pupil-Teacher ratio	50	45
(5) Cost per pupil (Rs.)	47·6	73·1
(6) As 10 per cent of the schools are to be raised to a higher standard of quality (say, double the cost per pupil) the cost would be (Rs.)	52·4	80·4

13. The cost of the programme will then be as shown in the following table:

	1975-76	1985-86
(1) Total enrolment (in 000's)	71,550	76,239
(2) Cost per pupil (Rs.)	52·4	80·4
(3) Total cost (Rs. in 000's)	3,749,220	6,129,616

HIGHER PRIMARY EDUCATION

14. At this stage, we expect facilities for about 90 per cent of the age-group by 1985-86. Of these, part-time education will be provided for 20 per cent of the children, both in 1975-76 and in 1985-86. In the first decade, the part-time classes will be of two types. (1) for those who have already completed the lower primary stage and want to continue their studies further; and (2) literacy classes for those who have not been to school or have not been able to complete the lower primary stage. In the second decade, only the first category of part-time facilities will remain. But the numbers enrolled therein would increase. The details of these programmes have been discussed in Chapter VII.

15. We also make the following assumptions:

(1) The average annual salary of a teacher would be Rs. 2,100 in 1975-76 (One trained graduate teacher with an average annual salary of Rs. 3,000 for three primary school teachers with an average annual salary of Rs. 1,800), and Rs. 2,875 in 1985-86 (One graduate trained teacher with an average annual salary of Rs. 4,000 for three primary school teachers with an average annual salary of Rs. 2,500).

(2) The non-teacher costs would be 20 per cent of the teacher costs.

(3) The average pupil-teacher ratio would be 35 in both the years.

16. The cost per pupil will be as follows:

	1975-76	1985-86
(1) Average annual salary of a teacher (Rs.)	2,100	2,875
(2) Add 10 per cent for retirement benefits (Rs.)	210	288
TOTAL (TEACHER COSTS) (Rs.)	2,310	3,163
(3) Non-teacher costs at 20 per cent of the above (Rs.)	462	633
TOTAL COSTS (Rs.)	2,772	3,796
(4) Pupil-Teacher ratio	35	35
(5) Cost per pupil (Rs.)	79·2	108·5

17. As 10 per cent of the schools have to be upgraded to optimum standards (*i.e.*, to about double the cost per pupil), the cost per student would be Rs. 87.1 in 1975-76 and 119.4 in 1985-86.

18. For part-time education, we have assumed that the cost per pupil per year will be Rs. 30 in 1975-76 and Rs. 50 in 1985-86.

19. The total costs will be as follows:

	1975-76	1985-86
(1) Enrolment (in 000's)		
Full-time	25,915	38,971
Part-time	6,479	9,743
TOTAL	32,394	48,714
(2) Costs (Rs. in 000's)		
Full-time	2,257,197	4,653,137
Part-time	194,370	487,150
TOTAL COSTS	2,451,567	5,140,287

20. The total estimated recurring expenditure on the first level of education in 1975-76 and 1985-86 would, therefore, be as follows:

	1975-76	1985-86
	(Rs. in 000's)	(Rs. n 000's)
(1) Pre-primary	236,956	488,531
(2) Lower primary	3,749,220	6,129,616
(3) Higher primary	2,451,567	5,140,287
TOTAL	6,437,743	11,758,434
(4) Percentage of toal anticipated expenditure of Rs. 15,562 million in 1975-76 and of Rs. 40,364 million in 1985-86	41·4	29·1

21. It will be seen that the cost proposed above are extremely austere. The pupil-teacher ratios we have proposed will be objected to by many. There is no provision made here for mid-day meals, for maintaining school health services, for free supply of school uniforms, and yet, the total cost required for this programme goes much beyond our proposed target in 1975-76, although it remains within manageable limits thereof by 1985-86. This is one of the reasons why we have proposed that programme of addition of one year to the school stage should be mainly postponed to the second decade.

LOWER SECONDARY EDUCATION

22. For the purpose of estimating costs we make the following assumptions:

(1) Ninety per cent of the teachers would be trained graduates whose average annual salary will be Rs. 3,000 in 1975-76 and Rs. 4,000 in 1985-86. The remaining 10 per cent of the teachers would have post-graduate qualifications—their average annual salary would be Rs. 4,500 in 1975-76 and Rs. 5,500 in 1985-86.

(2) The pupil-teacher ratio will be 25.

(3) Non-teacher costs will be at the rate of one-third of the teacher costs.

23. On these assumptions the cost per pupil will be as follows:

	1975-76	1985-86
(1) Average annual salary of a teacher (Rs.)	3,150	4,150
(2) Add 10% for retirement benefits (Rs.)	315	415
TOTAL (Teacher costs) (Rs.)	3,465	4,565
(3) Non-teacher costs one-third on the above (Rs.)	1,155	1,522
TOTAL COST (Rs.)	4,620	6,087
(4) Pupil-Teacher ratio (Rs.)	25	25
(5) Cost per pupil (Rs.)	184·8	243·5

24. As 10 per cent of the schools at this level are to be maintained at optimum standard (*i.e.*, at about double the cost per student), the average cost per student at this stage will be Rs. 203.3 in 1975-76 and Rs. 267.9 in 1985-86.

25. We have suggested in Chapter VIII that 20 per cent of the enrolments will be in part-time education. In general education, the cost per student in such education has been assumed at Rs. 60 for 1975-76 and Rs. 80 for 1985-86.

26. We have further assumed that the enrolments in vocational education will be 6·4 per cent by 1975-76 and 20 per cent by 1985-86 and the cost will be Rs. 500 in 1975-76 and Rs. 600 in 1985-86.

27. About 20 per cent of the enrolments in vocational education would also be on a part-time basis. The cost per student in such education has been assumed at Rs. 200 by 1975-76 and Rs. 250 by 1985-86.

28. On these assumptions, the total cost of education at this stage will be as follows:

	1975-76	1985-86
1. Enrolment (in 000's)		
General education		
Full-time	9,494	15,596
Part-time	2,373	3,899
TOTAL	11,867	19,495
Vocational education		
Full-time	654	3,898
Part-time	164	975
TOTAL	818	4,873
2. Costs (Rs. in 000's)		
General education		
Full-time	1,930,130	4,178,168
Part-time	142,380	311,920
TOTAL	2,072,510	4,490,088
Vocational education		
Full-time	327,000	2,338,800
Part-time	32,800	243,750
TOTAL	359,800	2,582,550
TOTAL (Lower Secondary)	2,432,310	7,072,638

HIGHER SECONDARY EDUCATION

29. We have recommended in Chapter III, that the duration of this stage should be one year till about 1975-76 and that in the following decade, it should be raised to two years. We have also recommended in Chapter VII, that 50 per cent of the enrolment at this stage should be in vocational courses and that 25 per cent of the total enrolment should be on a part-time basis.

30. On the basis of the salary scales recommended by us, the average annual salary of a teacher at this stage would be Rs. 4,500 in 1975-76 and Rs. 5,500 in 1985-86.

31. The non-teacher costs will be one-third of the teacher costs.

32. The pupil-teacher ratio will be 20:1.

33. On these assumptions, the cost per student in higher secondary education (general) would be as follows:

	1975-76	1985-86
(1) Average annual salaries of teachers (Rs.)	4,500	5,500
(2) Add 10 per cent for retirement benefits (Rs.)	450	550
TOTAL (Teacher costs) (Rs.)	4,950	6,050
(3) Add non-teacher costs @1/3rd of the teacher costs (Rs.)	1,650	2,017
TOTAL (Rs.)	6,600	8,067
(4) Pupil-teacher ratio	20	20
(5) Cost per pupil (Rs.)	330.0	403·4

34. As 10 per cent of these institutions are to be upgraded to optimum standards (i.e., about double the cost per pupil), the cost per student would be Rs. 363.0 in 1975-76 and Rs. 443·7 in 1985-86.

35. We have also assumed that the cost in the vocational courses will be Rs. 700 in 1975-76 and Rs. 800 in 1985-86.

36. The costs in part-time education (general) would be Rs. 120 in 1975-76 and Rs. 160 in 1985-86. In vocational courses, these costs have been assumed at Rs. 300 in 1975-76 and Rs. 350 in 1985-86.

37. On these assumptions, the cost of education at this stage will be as follows:

	1975-76	1985-86
(1) Enrolment (in 000's)		
General Education		
Full-time	1,212	2,578
Part-time	404	859
TOTAL	1,616	3,437
Vocational Education		
Full-time	1,030	2,577
Part-time	343	859
TOTAL	1,373	3,436
(2) Costs (Rs. in 000's)		
General Education		
Full-time	439,956	1,143,859
Part-time	48,480	137,440
TOTAL	488,436	1,281,299
Vocational Education		
Full-time	721,000	2,061,600
Part-time	102,900	300,650
TOTAL	823,900	2,362,250
GRAND TOTAL (Higher Secondary)	1,312,336	3,643,549

INDIRECT EXPENDITURE ON SCHOOL EDUCATION

38. **Direction and Inspection.** The expenditure on direction and inspection is now 1.9 per cent of the total. In order to give effect to the various recommendations we have made to strengthen administration and supervision, including in-service education of teachers, we propose to increase this expenditure to 2·5 per cent of the total in 1975-76 and to 4 per cent in 1985-86.

39. We have made the following assumptions regarding scholarships at the school stage:

(1) At the higher primary stage, 2·5 per cent of the students would get scholarships in 1975-76 and 5 per cent in 1985-86. The average amount of the scholarships would be Rs. 60 per annum. The bulk of scholarships will be needed for meeting indirect costs, but a few larger scholarships will be provided to cover hostel charges also.

(2) In general secondary education both lower and higher, 5 per cent of the students will receive scholarships by 1975-76 and 10 per cent by 1985-86. The average amount of the scholarship will be Rs. 150 per year. As said earlier, some of these scholarships would cover indirect costs and others would cover hostel charges also.

(3) In vocational secondary education 30 per cent of the students will get scholarships by 1975-76 and 50 per cent by 1985-86. The amount of the scholarships should be Rs. 300 per year at the lower secondary stage and Rs. 400 per year at the higher secondary stage.

40. On these assumptions, the cost of the scholarships programme would be as follows:

TABLE 19.19—ESTIMATED COSTS ON SCHOLARSHIPS AND STIPENDS AT SCHOOL STAGE
(1975-76 and 1985-86)

Type of education	Total enrolment in full time courses	% of students getting scholarships	Total number of scholarships	Average annual value of of scholarship	Total cost on scholarships
	(000's)		(000's)	Rs.	(Rs. in 000's)
1975-76					
Higher primary	25,915	2·5	648	60	38,880
Lower secondary :					
General	9,494	5·0	475	150	71,250
Vocational	654	30·0	196	300	58,800
Higher secondary :					
General	1,212	5·0	61	150	9,150
Vocational	1,030	30·0	309	400	123,600
TOTAL	38,305		1,689		301,680
1985-86					
Higher primary	38,971	5·0	1,949	60	116,940
Lower secondary :					
General	15,596	10·0	1,560	150	234,000
Vocational	3,899	50·0	1,950	300	585,000
Higher secondary :					
General	2,578	10·0	258	150	38,700
Vocational	2,577	50·0	1,289	400	515,600
TOTAL	63,621		7,006		1,490,240

41. **Buildings**. We have made an *ad hoc* provision of 2·5 per cent for buildings. It is less than the present allocation, although the amount, in absolute terms, will be much bigger. This highlights the need to economise on buildings.

42. **Total Expenditure**. We can now sum up the total expenditure on school education—recurring and capital—as anticipated for the years 1975-76 and 1985-86. This has been done in Table 19·20.

43. The implications of these estimates in terms of teachers' salaries, pupil-teacher ratios, levels of non-teacher expenditure, etc., have been given (alongwith comparisons for earlier years) in Table 19·21.

TABLE 19·20. EXPENDITURE ON SCHOOL EDUCATION (1975-76 and 1985-86)

	Total expenditure (Rs. in 000's)		Percentage of total expenditure	
	1975-76	1985-86	1975-76	1985-86
(1) *Recurring (Direct)*				
Pre-primary	236,956	488,531	1·5	1·2
Lower primary	3,749,220	6,129,616	24·1	15·2
Higher primary	2,451,567	5,140,287	15·8	12·7
TOTAL	6,437,743	11,758,434	41·4	29·1
Lower Secondary :				
General	2,072,510	4,490,088	13·3	11·1
Vocational	359,800	2,582,550	2·3	6·4
TOTAL	2,432,310	7,072,638	15·6	17·5
Higher Secondary :				
General	488,436	1,281,299	3·1	3·2
Vocational	823,900	2,362,250	5·3	5·8
TOTAL	1,312,336	3,643,549	8·4	9·0
TOTAL Recurring (Direct)	10,182,389	22,474,621	65·4	55·7
(2) *Recurring (Indirect)*				
Direction and Inspection	389,050	1,614,560	2·5	4·0
Scholarships	301,680	1,490,240	1·9	3·7
TOTAL	690,730	3,104,800	4·4	7·7
3) *Recurring* (Direct and Indirect)	10,873,119	25,579,421	69·9	63·4
(4) *Capital*				
Buildings and Equipment	389,050	1,008,890	2·5	2·5
(5) TOTAL (School Education)	11,262,169	26,588,311	72·4	65·9

N.B.—Totals do not tally due to rounding of figures.

TABLE 19·21. AVERAGE ANNUAL COST PER PUPIL (1950-51 to 1985-86)

Year	Average annual salary per teacher	Number of pupils per teacher	Percentage of non-teacher costs to teacher costs	Average annual cost: Due to teacher costs	Average annual cost: Due to non-teacher costs	Average annual cost: Total
	Rs.			Rs.	Rs.	Rs.
Pre-Primary Education						
1950-51	914	25	51·3	37	19	55
1965-66	1,000	31	54·3	35	20	55
1975-76	1,800	40	50·0	50	25	74
1985-86	2,500	40	50·0	69	34	103
Lower Primary Education						
1950-51	545	34	24·6	16	4	20
1965-66	1,046	38	11·1	27	3	30
1975-76	1,800	50	20·2	43	9	52
1985-86	2,500	45	19·6	67	13	80
Higher Primary Education						
1950-51	682	24	32·0	28	9	37
1965-66	1,087	31	12·4	40	5	45
1975-76	2,100	35	20·0	73	14	87
1985-86	2,875	35	20·0	99	20	119
Lower Secondary Education (General)						
1950-51*	1,258	25	44·8	50	23	73
1965-66*	1,858	25	37·0	78	29	107
1975-76	3,150	25	33·3	152	51	203
1985-86	4,150	25	33·3	201	67	268
Lower Secondary Education (Vocational)						
1950-51**	1,705	16	86·8	106	92	197
1965-66**	2,887	15	100·0	208	208	417
1975-76	..	..	..	..	..	500
1985-86	..	..	..	..	..	600
Higher Secondary Education (General)						
1975-76	4,500	20	33·3	272	91	363
1985-86	5,500	20	33·3	333	111	444
Higher Secondary Education (Vocational)						
1975-76	..	..	..	..	..	700
1985-86	..	..	..	..	..	800

*High/Higher secondary schools.

**All types of vocational and technical schools.

Notes—1. The costs for the years 1950-51 and 1965-66 are at current prices and those for 1975-76 and 1985-86 are at constant prices of 1965-66.

2. Totals do not tally on account of rounding of figures.

SUPPLEMENTAL NOTE III

TENTATIVE ESTIMATES OF EXPENDITURE ON THE DEVELOPMENT OF HIGHER EDUCATION (1965—85)

1. We have recommended in Chapter XII that the admission in higher education should be on selective basis and the expansion should be related to manpower needs. We have recommended that more emphasis should be laid on professional education and that quality of education should be improved. We have also recommended that 30 per cent of the enrolment both at the undergraduate and postgraduate stages should be in part-time courses.

2. **Undergraduate Education.** On the basis of salary scales recommended by us, the average annual salary of a teacher at this stage would be Rs. 6,000 in 1975-76 and Rs. 7,500 in 1985-86. The corresponding salary of a teacher in arts and science colleges in 1965-66 was Rs. 4,000.

3. The non-teacher costs will be two-thirds of the teacher costs.

4. The pupil-teacher ratio will be 15 : 1.

5. On these assumptions, the cost per student at undergraduate level (excluding science and professional courses) will be as follows :

	1975-76	1985-86
(1) Average annual salary of a teacher (Rs.)	6,000	7,500
(2) Add 10 per cent for retirement benefits (Rs.)	600	750
TOTAL (Teacher costs) (Rs.)	6,600	8,250
(3) Add non-teacher costs @ 2/3 of teacher costs (Rs.)	4,400	5,500
TOTAL (Rs.)	11,000	13,750
(4) Pupil-teacher ratio	15	15
(5) Cost per pupil (Rs.)	733·3	916·7

6. For costing purposes we make the following assumptions:

(1) The enrolment in arts and commerce courses will be 40 per cent of the total. Of this, 70 per cent would be on a full-time basis and costed at the above rates. The remaining 30 per cent will be on a part-time basis and costed at Rs. 300 in 1975-76 and Rs. 400 in 1985-86.

(2) Sixty per cent of the total enrolment would be in professional and science courses and in quality institutions in the arts and commerce courses. This will be costed roughly at double the cost per pupil in the ordinary courses for arts and commerce *i.e.*, at Rs. 1,500 per student in 1975-76 and Rs. 2,000 per student in 1985-86. It must be noted that these are 'average' costs and that in quality and pace-setting institutions, the cost might be much higher, *i.e.*, about as much as 10 times that in the ordinary institutions.

(3) Of the total enrolment in professional and science courses given in (2) above, 30 per cent would be in part-time courses. This will be costed at Rs. 750 in 1975-76 and Rs. 1,000 in 1985-86.

7. On the above assumptions, the recurring cost of the programme at the undergraduate stage in 1975-76 and 1985-86 will be as given in Table on next page. The details of the enrolments assumed here have been discussed earlier in Chapter XII.

	1975-76	1985-86
(1) *Enrolment (in 000's)*		
Arts and Commerce		
Full-time	526	896
Part-time	226	384
TOTAL	752	1,280
Science and Vocational Education		
Full-time	790	1,344
Part-time	339	576
TOTAL	1,129	1,920
(2) *Cost (Rs. in 000's)*		
Arts and Commerce		
Full-time	385,716	821,363
Part-time	67,800	153,600
TOTAL	453,516	974,963
Science and Vocational Education		
Full-time	1,185,000	2,688,000
Part-time	254,250	576,000
TOTAL	1,439,250	3,264,000
GRAND TOTAL	1,892,766	4,238,963

8. **Postgraduate Education.** At the postgraduate stage, costing becomes even more difficult because the range of variation is very large—from course to course and from institution to institution. For purposes of these estimates, we have made the following assumptions:

(1) 40 per cent of the total enrolment at the postgraduate stage would be in courses of arts and commerce. Of these, 30 per cent would be in correspondence and part-time education.

(2) The remaining 60 per cent of the enrolment would be in science and professional courses. Of this also, 30 per cent would be in part-time and correspondence education.

(3) The 'average' cost per student in courses in arts and commerce has been assumed at Rs. 3,000 for 1975-76 and Rs. 3,600 in 1985-86. In part-time courses, the cost assumed is Rs. 900 in 1975-76 and Rs. 1,200 in 1985-86.

(4) In courses of science and professional education the 'average' cost per student has been assumed at Rs. 5,000 in 1975-76 and Rs. 6,000 in 1985-86. In part-time courses the cost is assumed at Rs. 2,500 in 1975-76 and Rs. 3,000 in 1985-86.

9. On these assumptions, the estimated expenditure on postgraduate education in 1975-76 and 1985-86 would be as shown in the table on page 508. The estimates regarding enrolment have been discussed earlier in Chapter XII.

	1975-76	1985-86
(1) *Enrolment (in 000's)*		
Arts and Commerce		
Full-time	90	269
Part-time	38	115
TOTAL	128	384
Science and Vocational Education		
Full-time	135	403
Part-time	58	173
TOTAL	193	576
(2) *Cost (Rs. in 000's)*		
Arts and Commerce		
Full-time	270,000	968,400
Part-time	34,200	138,000
TOTAL	304,200	1,106,400
Science and Vocational Education		
Full-time	675,000	2,418,000
Part-time	145,000	519,000
TOTAL	820,000	2,937,000
GRAND TOTAL	1,124,200	4,043,400

SCHOLARSHIPS

10. For costing scholarships, we have made the following assumptions:

(1) In courses in arts and commerce at the undergraduate stage, the average value of a scholarship will be Rs. 75 per month and it would be awarded to 15 per cent of the full-time enrolment in 1975-76 and to 25 per cent of that in 1985-86.

(2) In courses in science and professional education at the undergraduate stage, the value of the scholarship will be Rs. 125 per month and it will be awarded to 30 per cent of the enrolment in full-time courses in 1975-76 and to 50 per cent of that in 1985-86.

(3) At the postgraduate stage, the average value of the scholarship will be Rs. 300 per month and it would be awarded to 25 per cent of the students in full-time education in 1975-76 and to 50 per cent of those in 1985-86.

11. On these assumptions, the total expenditre on the programme would be as shown in Table 19.22.

TABLE 19·22. ESTIMATED COSTS ON SCHOLARSHIPS/STIPENDS TO STUDENTS IN HIGHER EDUCATION (1975-76 and 1985-86)

Type of education	Total enrolment in full-time courses	% of students getting scholarships	Total number of scholarships	Average annual value of scholarships	Total cost on scholarships
	(000's)		(000's)	Rs.	(Rs. in 000's)
1975-76					
Undergraduate					
Arts and Commerce	526	15	79	900	71,100
Science and Vocational	790	30	237	1,500	355,500
Postgraduate	224	25	56	3,600	201,600
TOTAL	1,540		372		628,200
1985-86					
Undergraduate					
Arts and Commerce	896	25	224	900	201,600
Science and Vocational	1,344	50	672	1,500	1,005,000
Postgraduate	672	50	336	3,600	1,209,600
TOTAL	2,912		1,232		2,416,200

12. In the light of the above discussions, the total estimated cost on higher education in 1975-76 and 1985-86 will be as given in Table No. 19·23 below. Its implications in terms of average annual salaries of teachers, pupil-teacher ratios, level of non-teacher costs and cost per student are given in Table No. 19·24.

TABLE 19·23. EXPENDITURE ON HIGHER EDUCATION (1975-76 to 1985-86)

Type of education	Total expenditure (Rs. in 000's)		Percentage to total expenditure	
	1975-76	1985-86	1975-76	1985-86
(1) *Recurring* (*Direct*)				
Undergraduate				
Arts and Commerce	453,516	974,963	2·9	2·4
Science and Vocational	1,439,250	3,264,000	9·3	8·1
TOTAL	1,892,766	4,238,963	12·2	10·5
Postgraduate				
Arts and Commerce	304,200	1,106,400	1·9	2·7
Science and Vocational	820,000	2,937,000	5·3	7·3
TOTAL	1,124,200	4,043,400	7·2	10·0
TOTAL—Recurring (Direct)	3,016,966	8,282,363	19·4	20·5
(2) *Recurring* (*Indirect*)				
Scholarships	628,200	2,416,200	4·0	6·0
(3) *Total Recurring* (Direct and Indirect)	3,645,166	10,698,563	23·4	26·5
(4) *Capital*				
Buildings and Equipment	576,855	2,673,486	3·7	6·6
TOTAL Higher Education	4,222,021	13,372,049	27·1	33·1

TABLE 19.24. AVERAGE ANNUAL COST PER PUPIL (1950-51 to 1985-86)

Type of institution	Average annual salary per teacher	Number of pupils per teacher	Percentage of non-teacher costs to teacher costs	Average annual cost per pupil		
				Due to teacher costs	Due to non-teacher costs	Total
	Rs.			Rs.	Rs.	Rs.
Undergraduate						
Arts and Commerce						
1950-51*	2,696	20	73·7	133	98	231
1965-66*	4,000	20	63·8	200	128	328
1975-76	6,000	15	66·7	440	293	733
1985-86	7,500	15	66·7	550	367	917
Science and Vocational						
1950-51**	3,948	11	118·1	357	422	779
1965-66**	6,410	11	100·0	583	583	1,167
1975-76	..	..	..	..	..	1,500
1985-86	..	..	..	..	..	2,000
Postgraduate						
Arts and Commerce						
1975-76	10,000	8	118	1,375	1,625	3,000
1985-86	12,000	8	118	1,650	1,950	3,600
Science and Vocational						
1975-76	..	..	..	..	..	5,000
1985-86	..	..	..	..	..	6,000

*All types of colleges for arts and Science (Intermediate to Postgraduate).

**All types of vocational/professional colleges.

SUPPLEMENTAL NOTE IV

UNIT COSTS IN HIGHER EDUCATION

Considering the importance of unit cost studies in higher education, where the provision of educational facilities is much more expensive than at other levels of education, the Education Commission requested a few universities to investigate the per student expenditure in higher education under their jurisdiction. Accordingly, twelve universities, namely, Andhra, Annamalai, Bhagalpur, Bombay, Jiwaji, Kurukshetra, Nagpur, Osmania, Poona, Rajasthan, Sardar Vallabhai and Utkal conducted such studies which are being presented in a separate volume.

Being a comparatively new field, where not much systematic work has been done so far in our country, these studies throw up interesting results. These relate to both undergraduate and postgraduate courses in various faculties in general as well as in professional education. The results have been summarised and are given in Tables 19.25 to 19.29. These deal with costs in university teaching departments and university/constituent colleges and affiliated colleges.

A glance at these statements is enough to show how wide the variations in the costs are: While some variation is, no doubt, due to the differences in the methodology and the scope of these studies, a good deal of the variation may be due to the differences in the levels of the facilities and services provided in these institutions which in turn depend on such variable factors as salaries of teachers, student-teacher ratio, library, laboratory and other facilities provided, besides the capital cost.

In order that these studies are more useful, it is necessary that these be conducted on a uniform pattern based on agreed concepts and definitions. We feel that the UGC should assist some universities to conduct such investigations periodically on the basis of standardized techniques.

19·25. COST PER STUDENT IN UNIVERSITIES (UNIVERSITY TEACHING DEPARTMENTS, FACULTIES AND UNIVERSITY CONSTITUENT COLLEGES)

	Andhra	Annamalai	Bhagalpur	Jiwaji	Kurukshetra	Nagpur	Osmania	Poona	Rajasthan	Sardar Vallabh	Utkal
Postgraduate Courses	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Arts	998	1,861	490	241	..	736	922	1,684	1,681	1,148	1,226
Commerce	998	..	490	262	..	..	847	..	..	650	1,256
Science	..	1,851	5,011	397**	2,208	2,589	..	2,752	5,251	3,220	..
Social Sciences	..	..	..	261	1,666	..	..	..	..	..	..
Languages	..	..	..	..	1,776	..	..	..	..	..	..
Vedic Studies	..	..	..	..	2,608	..	..	..	..	..	..
Engineering	..	2,424	..	..	..	..	2,116*	..	..	..	..
Education	..	8,566	..	..	..	..	..	..	..	..	..
Oriental Studies	..	13,119	..	..	..	..	..	..	..	..	..
Fine Arts	..	..	..	..	..	..	..	..	..	..	..
Agriculture	..	5,432	..	..	..	..	..	..	..	..	..
Law	..	..	..	358	..	..	..	..	966	..	..
Undergraduate Courses											
Arts	..	729	409	219	1,170	..	..	..	552	308	..
Commerce	..	..	..	278	..	..	..	..	..	434	..
Science	..	586	489	..	1,463	..	..	..	599	372	..
Engineering and Technology	..	1,045	..	..	..	..	..	1,525	..	1,574	1,358
Education	..	448	..	..	..	..	..	725	..	..	..
Oriental Studies	..	783	..	..	..	..	..	..	..	..	..
Fine Arts	..	1,229	..	..	..	..	..	..	..	..	..
Agriculture	..	1,183	..	..	..	..	..	..	..	824	..
Law	..	..	..	117	..	..	..	302	..	..	..

*Science and technology.

**Average of science subjects.

TABLE 19.26. BOMBAY UNIVERSTITY

(a) Cost per Student in Postgraduate Departments (1963-64)

Department	Instruction	Instruction including research
	Rs.	Rs.
1. Economics	962	1,460
2. Civics and Politics	495	534
3. Business Management	1,294	1,244
4. Sociology	613	688
5. ~~English~~	1,410	1,394
6. Sanskrit	2,116	2,194
7. Mathematics	1,550	1,519
8. Applied Psychology	1,926	1,816
9. Statistics	1,483	1,470
10. Law	416	436
11. Chemical Technology	2,665	2,569

(b) Cost per Student in Colleges for

Year	Commerce	Training	Law	Arts & Science	Science	Engineering	Medicine	Dentistry
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1949-50	226	1,060	107	350	1,361	2,092	879	553
1950-51	212	1,063	162	272	1,858	1,000	726	888
1951-52	246	970	146	312	1,333	574	816	897
1952-53	282	972	156	310	1,291	1,077	923	913
1953-54	156	815	122	298	1,192	833	1,037	814
1954-55	171	677	149	297	..	1,260	..	..
1955-56	177	428	160	298	1,384	1,205	1,216	1,591
1956-57	148	540	162	284	1,330	1,203	1,248	1,570
1957-58	168	602	164	302	1,696	1,241	1,342	1,671
1958-59	179	707	162	285	1,603	1,314	1,725	1,485
1959-60	172	787	171	327	1,543	1,190	1,973	1,835
1960-61	253	815	166	351	1,616	1,535	2,033	2,005
1961-62	347	872	173	359	1,453	2,359	1,652	2,281
1962-63	317	744	208	384	1,643	1,316	1,693	2,782
1963-64	307	845	205	431	1,497	1,194	2,155	2,767

TABLE 19.27. NAGPUR UNIVERSITY

(a) Cost per Student in Undergraduate Institutions, 1964-65

Institution	Cost per student
	Rs.
1. College of Arts (Smt. Binzani M.M. College)	433
2. College of Science (M.M. College of Science)	450
3. Institute of Technology (Laxminarayan Institute of Technology)(a)	1,857
4. College of Arts & Science (Hislop College)(b)	497
5. College of Arts, Science & Commerce (Dhanwate National College)	222

(*a*) The institute has a very small enrolment for the master's degree, so that practically it may be treated as an undergraduate institution.

(*b*) This college has only one postgraduate department (Sociology), the expenditure on which has been deducted from the total expenditure. It has been treated as an undergraduate institution combining arts and science.

(b) *Cost per Student in Colleges with Undergraduate and Postgraduate Sections*, 1964-65

Institution	Cost per Student
	Rs.
1. College of Commerce (G.S. College of Commerce and Economics, Nagpur)	
A. Undergraduate Section	281
B. Postgraduate Section	360
2. College of Agriculture (Government College of Agriculture, Nagpur)	
A. Undergraduate Section	873
B. Postgraduate Section	1,613

TABLE 19.28. OSMANIA UNIVERSITY

Cost per Student in Colleges (1963-64)

College	Cost per Student
(A) *University and Constituent Colleges*	Rs.
1. University College of Science	1,027
2. University College of Arts & Commerce	775
3. Evening College, Secunderabad	687
4. Nizam College	681
5. Saifabad Science College	637
6. Women's College	612
7. Arts & Science College, Secunderabad	564
8. City Science College	453
9. Arts and Science College, Warangal	404
10. Hyderabad Evening College	329
(B) *Private Colleges*	
11. Sri Venkateswara Arts & Science College, Palem	757
12. Hindi Mahavidyalaya, Hyderabad	693
13. Arts & Science College, Jadcherla	675
14. Urdu Arts College	659
15. Anwar-U-loom College, Hyderabad	497
16. Badruka College of Commerce (Day)	444
17. Vanitha Mahavidyalaya, Hyderabad	443
18. Arts & Science College, Godwal	440
19. R.B.V.R.R. Women's College	382
20. Nanakram Bhagwandas Science College	377
21 Vivek Vardhani College (Day)	364
22. Mumtaz College	358
23. St. Francis College, Secunderabad	337
24. New Science College, Hyderabad	284
25. Badruka College (Evening)	221
26. Vivek Vardhani College (Evening)	212
(C) *Government Colleges*	
27. Government Arts & Science College, Adilabad	829
28. Government Nagarjuna College, Nalgonda	587
29. Government Arts & Science College, Siddipet	578
30. Government Giriraj College, Nizamabad	509
31. S.R. & B.G. N.R. Government Arts College, Khammam	457
32. S.R. Government College, Karimnagar	387

TABLE 19.29: POONA UNIVERSITY

Cost per Student in Undergraduate Courses

College	Pre-Degree	3-year degree course	4-year degree course
	Rs.	Rs.	Rs.
Arts			
1. Fergusson College, Poona	269	342	319
2. Shri Shahu Mandir College, Poona	203	256	236
3. H.P.T. College, Nasik	348	456	409
4. R. B. Borawake College, Shrirampur	454	587	538
Science			
1. Fergusson College, Poona	352	400	380
2. H. P. T. College, Nasik	448	521	486
3. R. B. Borawake College, Shrirampur	598	814	701
Commerce			
1. B. M. College of Commerce	247	224	232
2. B. Y. K. College of Commerce, Nasik	323	309	314
3. C. D. Jain College, Shrirampur	365	532	444
4. Shri Sahau Mandir College, Poona	222	285	249
Law			
1. Law College, Poona	..	302	..
Education			
1. Tilak College of Education	..	725	..
Engineering			
1. College of Engineering, Poona	..	1,525	..

SUPPLEMENTAL NOTE V

TABLE 19.30. CONSOLIDATED STATEMENT SHOWING ANTICIPATED RECURRING AND CAPITAL EXPENDITURE ON EDUCATION (1966—85)

Year	Expenditure on education (Rs. in million)			Percentage to total of	
	Total	Recurring	Capital	Recurring Expenditure	Capital Expenditure
	Rs.	Rs.	Rs.	Rs.	Rs.
1966-67	6,600	5,909	691	89·5	10·5
1967-68	7,260	6,543	717	90·1	9·9
1968-69	7,986	7,242	744	90·7	9·3
1969-70	8,785	8,013	772	91·2	8·8
1970-71	9,664	8,863	801	91·7	8·3
1971-72	10,630	9,799	831	92·2	7·8
1972-73	11,693	10,830	863	92·6	7·4
1973-74	12,862	11,966	896	93·0	7·0
1974-75	14,148	13,218	930	93·4	6·6
1975-76	15,562	14,596	966	93·8	6·2
1976-77	17,118	16,014	1,104	93·6	6·4
1977-78	18,830	17,568	1,262	93·3	6·7
1978-79	20,713	19,271	1,442	93·0	7·0
1979-80	22,784	21,136	1,648	92·8	7·2
1980-81	25,062	23,178	1,884	92·5	7·5
1981-82	27,568	25,415	2,153	92·2	7·8
1982-83	30,325	27,864	2,461	91·9	8·1
1983-84	33,358	30,545	2,813	91·6	8·4
1984-85	36,694	33,479	3,215	91·2	8·8
1985-86	40,364	36,682	3,682	90·9	9·1
TOTAL	378,006	348,131	29,875	92·1	7·9

N.B. The capital expenditure is comparatively restricted in the first decade because of the need to upgrade salaries of teachers and to provide adequate scholarships.

PART FOUR

SUPPLEMENTARY PAPERS

This part of the Report includes the following documents:

1. **Minute of Supplementation** by Shri R. A. Gopalaswami.

2 **Appendices**

I. An Explanatory Note on Enrolment Statistics included in the Report.

II. Resolution of the Government of India setting up the Education Commission.

III. Consultants to the Education Commission.

IV. Task Forces and Working Groups.

V. Persons Interviewed by the Education Commission in Delhi.

VI. Secretariat of the Commission.

VII. Liaison Officers of State Governments and Union Territories.

VIII. Programme of Visits of the Education Commission.

IX. Expenditure Incurred on the Education Commission.

3. **Summary of Recommendations.**

MINUTES. OF SUPPLEMENTATION

by Shri R. A. Gopalaswami, Member, Education Commission

The object of this minute is to submit the accompanying report, bearing the title "Manpower-Planned Development And Reform Of Higher Education" for consideration by the Government of India and all the State Governments in India.

2. When I began this work, I had intended to prepare a perspective plan-frame for the entire National Educational System, in all its levels, and relate it to a forecast of growth of the National Economy. This relationship was intended to be worked out in two aspects, one in relation to the growing requirements of educated manpower which would be rendered necessary by economic growth; and the other in relation to growth in the allocation of resources for the National Educational System which would be rendered possible by economic growth. When this ambitious project was half-way through, I fell ill; and the work was at first interrupted and subsequently delayed. Eventually, I limited the scope of the project to higher education and completed a report and presented it for consideration by my colleagues of the Commission. This was in the middle of April this year. By that time it had become too late. I had missed my chance—such as it might have been—of establishing a meeting of minds and co-ordinating conclusions and recommendations.

3. The process of development of higher education may be described as being "manpower-planned" when it includes the following as one of its major objectives: The productive capacity of higher educational institutions (assessed in terms of the annual outturn of higher educated manpower cohorts) should be increased from year to year at such a rate that the annual outturn matches (in number of cohorts, as well as their composition by classification of higher educational attainment) the parallel growth of annual demand of the developing national economy for higher educated manpower cohorts required for first employment.

4. The process of reform of higher education may be described as being "manpower-planned", when such reform is designed to bring about a planned adaptation of higher-educational curricula as well as the organization and methods of higher educational institutions and higher educational administration, so as to meet the requirements of "manpower-planned" development of higher education with the maximum practical efficiency.

5. I am not qualified by experience to deal with syllabuses, teaching methods and such other matters as may be described as the "technology" of higher education. My report is, accordingly, limited to those considerations of public policy relating to manpower-planned development and reform of higher education (as defined above) and connected questions of administrative organization on which decisions will have to be taken by Government.

There is also one further limitation. It is necessary for some purposes that the time-horizon of a perspective plan should lie beyond two decades. These are mainly educative purposes. The interval is too long, however, for operational decisions to be taken by Governments in the next few years. As my report is related to such decisions only, my time-horizon is nearer. It lies around 1975-76, the final year of the Fifth Plan Period.

6. The scope of this report presents a special difficulty. It is not limited to higher educational institutions and higher educational administration. I have to deal also with the enterprises and institutions in which higher educated persons are employed, including the occupations in which they are self-employed. This would not have mattered so much if there were an official or otherwise generally accepted system of correlation of educational planning and manpower-planning. Unfortunately there is, as yet, no such system. It was necessary for me, at least partially, to develop the conceptual framework of such a system.

7. The foregoing remark is apt to be construed as a reflection on our administrative organization, which it is not. I hasten, therefore, to add that there is, as yet, no such system in the United States of America or the United Kingdom either. It is well known that our effort to realize a planned economy within the framework of a free,

democratic and quasi-federal policy is a pioneering venture. It is wholly unprecedented in history. In every aspect of this effort we come up against the difficulty that there is no ready-made model to follow. We are obliged to find our own way by trial and error.

8. We have made not only a good beginning but also achieved rapid progress in "manpower-planned" development of one particular branch of higher education, *viz.*, engineering education. As a result, we do possess a valuable fund of 'trial-and-error experience' on which to draw. This experience has been intensively studied in the Institute of Applied Manpower Research. The nature and results of these studies have already been made public in three reports issued by the Institute. I have made use of these results and endeavoured to adapt and extend them to the entire area of higher education. Some special studies were necessary in order to effect such adaptation and extension. They were also carried out in the Institute.

9. Engineering education is one branch of higher education where it is indubitable that the planned rate of growth has to be the fastest. Even in respect of this branch, the studies made in the Institute have led to the conclusion that the present tendency to go on accelerating the rate of growth is mistaken and should be corrected. There are two kinds of manpower shortages. One is quantitative and the other is qualitative. The conclusion is that the problem of quantitative shortage of engineering manpower is ceasing to exist. The time has arrived when the rate of growth of institutional capacity has to be moderated, instead of being further accelerated. A change of tempo is needed also in order efficiently to plan and implement these reforms which are necessary for solving the problem of qualitative shortage which has now come to the forefront.

10. While the foregoing appreciation of the situation is not yet generally accepted in respect of engineering education, it is likely that there would be a larger measure of agreement on a similar appreciation about higher education as a whole, and more particularly about arts education. The report deals fully with this wider question and gives reasons for believing that our current rate of accelerating growth of higher education (taken as a whole, inclusive of all branches) is outrunning the growing capacity of our National Economy to employ the growing numbers of higher educated manpower efficiently. It is also outrunning the growing capacity to allocate the resources needed for maintaining and raising the quality and utility of higher education.

11. We are, in fact, going through a process of educational inflation which requires to be brought under control for much the same reasons as the other and more familiar processes of inflation in the National Economy.

To this end it is necessary to fix (not a target but) a ceiling for the overall rate of growth of higher education including all its branches. The report proceeds on the basis that a decision of this kind must be taken as the starting point for subsequent determination of appropriately different and consequently unequal rates of growth for different branches of higher education, so as to correlate such unequal rates to the unequal rates of growth of different occupational groups of higher educated manpower which will be dictated by the changing pattern of employment in the National Economy.

12. There is, as earlier noted, no generally accepted system of correlation of educational planning and manpower planning. It is widely assumed by many who sense the need for a system in a vague way, that it is some kind of a number-game to be played by expert statisticians who have specialized in that subject. This assumption is wide of the mark. Planning decisions relating to education and manpower (like all other planning decisions) are, no doubt, reached in the light of statistical data. But the decisions are not mere statistical computations; they are administrative judgments. This is so for two reasons. First our statistics are incomplete and defective for purposes of forecasting the future; and it will take time to improve them. Even if they are improved and the techniques are further elaborated, we cannot attain predictive finality. Secondly, we need to forecast the future, not in order to realise the future exactly as predicted, but to modify it to the extent practicable so as to attain policy objectives.

What is important, therefore, is not so much the improvement of statistics and research (needed though that is) but the improvement of administrative organizations which are responsible for programme-planning and programme-implementation.

They should be rendered increasingly competent to use available data, such as they are, and yet make increasingly better administrative judgments.

Stress is accordingly laid throughout my report on the development of needed administrative machinery.

13. The report is arranged as follows:

There are only four main recommendations. They are set out in the first chapter.

The next five chapters are explanatory. Beginning with a formal explanation of new concepts and special terminology, the meaning, purpose and implications of recommendations are made clear. An account is also included of the nature and results of special studies which were undertaken in order to link the results of previous studies about Engineering Manpower with present recommendations about Higher-Educated Manpower as a whole and the major occupational groups thereof.

The final chapter sets out a series of subsidiary recommendations about the division of executive responsibility between the Government of India and the State Governments and the further development of administrative machinery.

14. The four main recommendations may be very briefly restated here.

First. The Government of India and all the State Governments should accept the premises and objectives of public policy underlying manpower-planned development and reform of higher education and formally adopt an agreed statement of All-India Policy.

Secondly. The objectives of All-India Policy as thus settled, should be quantified in a framework of targets and ceilings (referred to in the report as the 'Higher Educational Perspective Plan-frame').

Thirdly. The responsibility for taking executive action at governmental level which will accrue as a result of adoption of the higher educational perspective plan-frame should be clearly defined and distributed. What the Government of India should do and what each State Government should do should be agreed upon.

Fourthly. The foregoing agreements should be placed before and accepted by Parliament and State Legislatures. Such acceptance should take the form of enactment of such legislation as may be needed in order to provide a firm statutory basis for implementation of the agreements.

15. What is described as the draft of a Higher Educational Perspective Plan-frame has been offered in the annexure to the first chapter of the report. Strictly speaking, it should have been referred to as the "nucleus of a draft". Before it can become operational, it will require to be not merely finalized but also amplified.

It is repeatedly emphasized in the report that the figures representing targets and ceilings (referred to as "control figures") which are specified in the draft are not intended to be and should not be regarded as unarguable results of exact statistical computations. They represent judgments, which I believe to be good ones. The Governments may accept my general appreciation of the situation and yet adopt different figures. The essential purpose of the draft (accompanied as it is by detailed exposition of the process by which the figures were arrived at) is to carry conviction that an exercise of the nature recommended is both necessary and practicable and should, therefore, be undertaken.

16. In concluding this minute, I wish to place on record my appreciation of the earnest and painstaking manner in which a number of relevant studies were carried out by various officers of the Institute of Applied Manpower and Research. Much of the data used in the accompanying report are based on careful studies made by Shri H. N. Pandit and Shri Q. U. Khan. I have benefited by advice and assistance which I received from Shri A. K. Das Gupta, Shri K. N. Sundaram and Dr. S. P. Agarwal.

R. A. GOPALASWAMI,
Member,
Education Commission

NEW DELHI,
29 *June*, 1966.

MANPOWER-PLANNED DEVELOPMENT AND REFORM OF HIGHER EDUCATION

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MANPOWER-PLANNED DEVELOPMENT AND REFORM OF HIGHER EDUCATION

CHAPTER I. STATEMENT OF FOUR SPECIFIC RECOMMENDATIONS

I. ALL-INDIA POLICY OF MANPOWER-PLANNED DEVELOPMENT AND REFORM OF HIGHER EDUCATION

There is need for ensuring that further development of higher education in India is planned so as to fulfil the following conditions:

First. The annual requirements of the country in respect of additions to the national stock of higher educated manpower should be assessed in advance with as much precision and firmness as may be found to be practicable. Arrangements should be made to secure that the assessed requirements are adequately met by the annual supply of higher educated manpower cohorts made available by all the higher educational institutions in the country.

Secondly. Arrangements should be made to ensure that higher educated manpower cohorts will not remain unemployed or wastefully under-employed. Employment should be made available as nearly as may be in those capacities in which they are able to make the best use of the educational preparation given to them.

Thirdly. The courses of studies which are at present provided in higher educational institutions should be reviewed in the light of the changes which are occurring in the pattern of employment of higher educated manpower cohorts. The structure and content of these courses of studies, as well as admission requirements, should be reviewed and the entire system reformed so as to provide the best possible educational preparation for the different occupational groups of higher educated manpower.

Fourthly. There is need for developing a new type of "promotional-extension" courses of studies for secondary educated persons who are already in employment and are found suitable for promotion, so as to raise their educational level to parity with that of higher educated manpower. Special arrangements necessary for this purpose should be devised and developed.

Fifthly. During the last decade, the demand for higher educated manpower cohorts has been increasing from year to year at a faster rate than ever before. At the same time, however, the annual out-turn of higher educated manpower cohorts from all the higher educational institutions of the country has been growing even faster than the demand. As a result, the difficulty of securing higher educated employment has been increasing; and the numbers of higher educated employment-seekers have grown excessively in different parts of the country. As employment becomes more difficult to secure, the pressure of demand for admission to higher educational institutions becomes intensified. Thus a process of "higher educational inflation" has been building up. This is likely to get worse and worse because "secondary educational inflation" has also been building up at the same time. It is now necessary to bring this inflationary pressure under control, without any avoidable delay. In order to secure this result, it is essential that a system of effective government control over the increase in the number of seats for enrolment of students in all higher educational institutions should be organised. On the basis of such control, it is further necessary to institute a system of competitive entrance requirements for all higher educational institutions, similar to the system developed in recent years for engineering educational institutions.

It is, therefore, recommended that the Government of India and all the State Governments should agree upon and adopt a statement of All-India Policy on "manpower-planned development and reform of higher education", embodying the foregoing considerations.

II. HIGHER EDUCATIONAL PERSPECTIVE PLAN FRAME

After achieving agreement on All-India policy, there would be need for a common All-India basis for organising "Manpower-Planned Development and Reform of Higher

Education" in accordance with such policy. To this end, it is necessary that the Government of India and all the State Governments should jointly agree upon and adopt a "Higher Educational Perspective Plan-Frame". Programmes of development and reform, to be planned and implemented by many different authorities, should be maintained in coordination with one another by the common requirements of conformity to the Higher Educational Perspective Plan-Frame. A draft of such a plan-frame has been prepared and is annexed to this chapter. The meaning, purpose, and implications of the "Interim Target Year" as well as the "Control Figures" which are specified in the draft Higher Educational Perspective Plan-Frame are explained in subsequent chapters of this report.

It is recommended that the Government of India and all the State Governments should jointly take the draft into consideration, examine the implications thereof, and in the light of the consensus reached on such examination, finalise and settle the control figures and agree to adopt the higher educational perspective plan-frame as the common All-India basis for formulation of programmes of development and reform.

III. SCHEME OF SPECIFICATION OF EXECUTIVE RESPONSIBILITY OF THE GOVERNMENT OF INDIA AND EACH OF THE STATE GOVERNMENTS

After achieving agreement on a common All-India policy and a common All-India basis for planning programme of development and reform in pursuance of that policy, it would become necessary to specify the nature and extent of executive responsibility to be severally undertaken by the Government of India and each of the State Governments in respect of planning and implementing specific individual schemes of development and reform. Suggestions have been offered in the final chapter of this report about how such specification may be best effected. *It is recommended that the Government of India and all the State Governments should jointly take these suggestions into consideration; examine the implications thereof; and, in the light of the consensus reached on such examination, finalise, and settle a scheme of specification of executive responsibility of the Government of India and each of the State Governments.*

IV. STATUTORY BASIS FOR "MANPOWER-PLANNED DEVELOPMENT AND REFORM OF HIGHER EDUCATION"

The reforms proposed to form part of the new All-India policy will require legislative sanction. It will also be necessary, in order to assure stability and continuity of purpose, to provide a statutory basis for the agreed scheme of specification of executive responsibility and the administrative machinery required for giving effect to the scheme. For these reasons it *is recommended that appropriate Acts of Parliament and State Legislatures should be enacted, so as to provide the statutory basis required for manpower-planned development and reform of higher education in India up to the Interim Target Year.*

ANNEXURE TO CHAPTER I

(DRAFT) HIGHER EDUCATIONAL PERSPECTIVE PLAN-FRAME

PART I. GROWTH OF THE NATIONAL STOCK OF HIGHER EDUCATED MANPOWER AND MAJOR OCCUPATIONAL GROUPS THEREOF

Perspective Planning Items		Computed Actuals (1960-61)	Control Figures for Interim Target Year
	TOTAL	1,432,000	4,000,000
I. National Stock of Higher Educated Manpower.	INDUSTRIAL Employment	191,000	1,100,000
	SERVICE Employment	1,004,000	2,200,000
	FARM-HOME Employment	142,000	400,000
	EMPLOYMENT SEEKERS	95,000	300,000
II. Higher Educated Manpower Groups	I. Higher Educated Teaching Manpower.	222,000	900,000
	II. Engineering Manpower	133,000	750,000
	III. Scientific and Technial Manpower (other than I and II)	181,000	650,000
	IV. Public Administrative and Corporate Managerial Manpower (other than I to III)	266,000	500,000
Higher Educated Manpower	(other than I to IV)	630,000	1,200,000
	NATIONAL STOCK TOTAL	1,432,000	4,00,000

(DRAFT) HIGHER EDUCATIONAL PERSPECTIVE PLAN-FRAME

PART II. GROWTH OF ANNUAL OUT-TURN OF HIGHER EDUCATIONAL COHORTS (BY TYPES AND LEVELS)

(Numbers in thousands)

Perspective Planning Items		Computed Actuals 1956-57			Computed Actuals 1961-62			Control Figures InterimTarget Year		
		National	Regional	Total	National	Regional	Total	National	Regional	Total
1		2	3	4	5	6	7	8	9	10
HIGHER EDUCATED MANPOWER COHORTS		48·7	44·0	92·7	81·4	69·1	150·5	150·0	175·0	325·0
Additional Higher Educational Cohorts re-enrolled in Higher Education .		..	35·0	35·0	..	60·0	60·0	..	75·0	75·0
HIGHER EDUCATIONAL COHORTS		48·7	79·0	127·7	81·4	129·1	210·5	150·0	250·0	400·0
Scientific and Technical Educational Cohorts	Academic-Pedagogical Science Education. ..	7·4	17·0	24·4	12·1	29·2	41·3	50·0	30·0	80·00
	Engineering Education	4·8	5·0	9·8	9·5	10·9	19·9	30·0	50·0	80·0
	Specialised Scientific and Technical Education (other than Engineering Education)	5·5	2·2	7·7	8·5	4·9	13·4	20·0	20·0	40·0
	TOTAL .	17·7	24·2	41·9	30·1	44·5	74·6	80·0	120·0	200·0
Arts Educational Cohorts	Academic-Pedagogical Arts Education	23·6	44·5	68·1	41·6	69·3	110·9	50·0	100·0	150·0
	Commercial, Legal, Administrative and other specialised Arts Education	7·4	10·3	17·7	9·7	15·3	25·0	20·0	30·0	50·0
	TOTAL	31·0	54·8	85·8	51·3	84·6	135·9	70·0	130·0	200·0

(DRAFT) HIGHER EDUCATIONAL PERSPECTIVE PLAN-FRAME

PART III GROWTH OF PUPIL-ENROLMENT AND TEACHER EMPLOYMENT IN HIGHER EDUCATIONAL INSTITUTIONS AND FINANCIAL PROVISION FOR DIRECT EXPENDITURE THEREON

Perspective Planning Items		Computed Actuals 1956-57	Computed Actuals 1961-62	Control Figures Interim Target Year
1		2	3	4
HIGHER EDUCATIONAL				
I. Cohort Out-turn (in thousands)	National .	48·7	81·4	150·0
	Regional .	79·0	129·1	250·0
	TOTAL .	127·7	210·5	400·0
II. Pupil Enrolment (in thousands)	National .	116	205	750
	Regional .	448	686	1000
	TOTAL .	564	891	1750
III. Pupil-Teacher Ratio	Natioanl .	11	10	10
	Regional .	19	17	15
	TOTAL .	17	15	12
IV. Teacher-Employment (in thousands)	National .	11	20	75
	Regional .	23	40	66
	TOTAL .	34	60	141
V. Funds for Direct Expenditure for Teachers (Rs. at constant 1960-61 prices)	National	9,862	11,682	12,000
	Regional .	7,465	7,757	9,000
	TOTAL .	8,231	9,048	10,640
VI. Funds for Direct Expenditure (in crores of rupees) (at constant 1960-61 prices)	National .	11	23	90
	Regional .	17	31	60
	TOTAL .	28	54	150

CHAPTER II, INTRODUCTORY EXPLANATION

SECTION I DEFINITION OF HIGHER EDUCATION

1. There is a twilight zone within which 'secondary education' ends and 'higher education' begins. It is necessary that this zone should be lighted up and a clear dividing line drawn between secondary education and higher education. This is necessary because we are dealing with estimates for large numbers of pupils and teachers and expenditure of large amounts of public funds and there should be no misunderstanding about what we are dealing with.

2. To begin with, what is education? For the purpose of this report, 'education' means an aggregate of curricula provided in educational institutions. Educational institutions are known by different names. We treat every institution of which particulars are included in the annual statistical returns of the Ministry of Education of the Government of India as the educational institution with which we are concerned. Every curriculum is a planned programme of study and/or training. Whether it is study or whether it is training, in either case it is 'education' (by definition) so long as it is provided in an educational institution as defined. There are programmes of study and training, outside educational institutions. Such programmes are distinguished from 'education' as 'apprentice training' or 'in-service training'.

3. All university degree courses, plainly form part of higher education, according to current usage. What about two types of courses provided in colleges which do not lead to the award of university degrees—the Pre-University course and the Intermediate course? Our answer is as follows:

(a) The pre-university course is deemed to be part of secondary education and not part of higher education.

(b) The intermediate course consists of programmes for two years. The first year programme (the junior intermediate course) is deemed to be part of secondary education and not part of higher education. The second year programme (senior intermediate course) is deemed to be part of higher education.

4. At this point, we propose to make an innovation. There is not merely a twilight zone of college education, but a zone not clearly defined which is at present called 'Vocational and Technical Education—School Level'. This has to be divided into three parts, one to be included in higher education, another to be included in secondary education and a third to be included in elementary education. We are concerned here only with identifying and defining that part, which is to be included in higher education and giving it a distinctive name. An outstanding instance of the higher types of curricula which we have in mind is the three-year-programme of technical education in polytechnics (conforming to curricular specifications drawn up by the All-India Council of Technical Education), which leads to the award of diplomas by Regional Boards of Technical Education. There is need for developing varied courses of this type and emphasising their importance and distinctive role in manpower-planned development and reform of higher education. Let us refer to such courses as 'Sub-professional courses'.

5. We define 'Sub-professional courses' by the following characteristic features.

(a) Admission to such courses should be selectively limited to persons who have successfully completed what is called the 'high stage' of general school education (or its equivalent, penultimate year programme of what is called the 'higher secondary stage').

(b) The course should require, for its completion not less than three years of institutional education after the completion of the 'high stage' of general school education or its equivalent.

(c) The course should conform to prescribed All-India specification and it should lead to awards such as diplomas made by competent educational authorities.

6. We may now define 'higher education' for the purpose of this report as comprising:

(a) all university degree curricula;

(b) all sub-professional curricula leading to diploma; and

(c) the senior intermediate course.

SECTION 2. LEVELS, SUB-LEVELS, TYPES AND DETAILED CLASSIFICATION OF HIGHER EDUCATIONAL CURRICULA AND AWARDS

7. 'Higher Education', as we have defined it, will not be accepted or recognised as higher education in the U.S.A., the U.S.S.R., the U.K., France, Japan or any other educationally developed country of the world. This is so, not merely because we have included sub-professional diploma courses in the definition, but also and mainly because the curricular specifications of many of our university degrees fall short of the minimum requirements of university education (or other education recognised as higher education) in these countries.

8. The foregoing statement applies to the B.A./B.Sc./B.Com.. degrees, which account for a large proportion of the annual out-turn of our universities. We cannot, very well, cease to recognise these degrees as 'higher education'. But we ought to focus attention on the distinction between those university degree courses which are recognisable as 'higher education' in the developed countries of the world and those which are not. We shall refer to the former as 'National Higher Education'; and, to the latter, as 'Regional Higher Education'.

9. These are the two main 'levels' of higher education. Within 'Regional Higher Education' there are two sub-levels of which one is represented by University Degree Courses and the other by Sub-professional diploma courses. Similarly, within 'National Higher Education' we may distinguish two sub-levels, one represented by 'advanced' courses and the other by 'ordinary' courses.

10. Our M.A./M.Sc./M.Com., degrees, as well as our degrees in engineering and medicine clearly qualify for inclusion in 'National Higher Education'. Our B.A./B.Sc./B.Com., degrees are clearly disqualified and must be included in 'Regional Higher Education'. There is, again, a twilight zone between the two levels of higher education, which we shall deal with as below:

(a) Any university degree course which can be completed after not more than four years of institutional education following the completion of the high stage or its equivalent in general school education is to be classified as 'Regional Higher Education', along with sub-professional diploma courses and the Senior Intermediate Course.

(b) All other university degree courses are to be classified as 'National Higher Education'.

Existing higher educational curricula and awards will be classified on this basis. It will be recognised that the 'ordinary' courses of national higher education, (as now defined) may, initially include courses which are not up to minimum standards of higher education in the developed countries. The intention is that such cases should be identified, reviewed and revised with reference to actual requirements for purposes of employment. They should have their standards raised up to the internationally accepted level, *if that is really necessary for purposes of employment. Otherwise, their duration should be shortened, and the contents adapted to actual needs.* In either event, these borderline courses will get properly classified as National Higher Education or Regional Higher Education, with reference to the criterion of international comparability of standards.

11. The Central Statistical Organisation of the Government of India and the Directorate General of Employment and Training in the Ministry of Labour have in recent years developed appropriate All-India schemes of classification by 'industry' as well as by 'occupation'. These important schemes are essential planning tools; and they have begun to come into practical use as such. It is essential that the tool kit should be added to. *These two schemes of classification should be supplemented by an approved All-India scheme of classification of 'Higher Educational Awards'.* All that is required for the purpose is that the Ministry of Education should maintain a classified schedule of all university degrees and other approved higher educational awards. The numbers used to designate the place of any particular higher educational award in the classified schedule would also serve as the code-number identifying that award. Periodical employment returns secured from

establishments in the private sector and public sector should provide for the classification of higher educated manpower by the code-numbers identifying the higher educational awards held by them.

12. In this report, we have proposed the beginning of such an All-India scheme of classification of higher educational awards; first by the demarcation of the two levels already proposed and then by the specification of the "five types" of higher education referred to in Part II of the Higher Educational Perspective Plan-Frame annexed to Chapter I. These five types include three types of "Scientific and Technical Education" and two types of "Arts Education". They also include two types of "academic-pedagogical" education and three types of "specialised" higher education. The names indicate which among all the higher educational awards are to be included under each of the five types. The two levels and five types will yield ten major heads of classification which can form the first digit of the code-number identifying every higher educational award. Each major head of classification should be divided and sub-divided into sub-heads, minor heads and detailed heads, in the manner familiarised by the authorities who deal with the budgeting and accounting of public funds. The proposed scheme of detailed classification of higher educated manpower will then serve as the starting point of systematic budgeting and accounting of higher educated manpower.

SECTION 3. DEFINITION OF "MANPOWER", "COHORTS" AND THE CONCEPT OF "MANPOWER-PLANNED DEVELOPMENT AND REFORM".

13. The word "manpower" may be used in an abstract sense to refer generally to the human capacity to perform useful work of any kind. More commonly, however the word is used as a collective name for an aggregate of human beings who possess such capacity.

It is customary to use the word "manpower" as meaning the same thing as the "labour force". This practice causes no difficulty in industrially developed countries, wherefrom the concept of "labour force" has emerged. In the conditions of our country it is convenient to use the word manpower to mean not only the labour force but also housewives. This is so because experience has shown that it is very difficult to draw the line which separates those rural housewives who "participate" in the "labour force" from others who do not. Statistics of the labour force and the derivation of the so-called participation rates, which are based on such a dividing line are apt to prove misleading. Manpower information becomes much more intelligible and easily usable when housewives are included.

For purposes of statistical calculation, working age limits have to be specified. In this report, accordingly, *we proceed on the following definition of manpower, as comprising all persons aged 16 to 59, with the exception of such of them as are enrolled as pupils in educational institutions.*

14. Though this report is limited in its scope to higher education and higher educated manpower, it has been found necessary to refer frequently to secondary education and secondary educated manpower. Hence the following definitions:

(i) A "higher educated person" is any person who holds a higher educational award. A "secondary educated person" is any person (not being a higher educated person) who has successfully completed either the high stage or the higher secondary stage of general school education. An "educationally classified person" means either a higher educated person or a secondary educated person.

(ii) Higher educated manpower means an aggregate of higher educated persons from which persons enrolled as pupils in educational institutions and persons aged 60 and above have been excluded. The expressions "Secondary Educated Manpower" and "Educationally Classified Manpower" refer to similar aggregates of secondary educated persons and educationally classified persons, subject to similar exclusions.

15. All persons who secure any higher educational award in any particular year are referred to as "higher educational cohorts of that year.

Among the higher educational cohorts of any year there are some who are re-enrolled in other courses of studies in higher education. They do not leave the educational institutions. These higher educated persons who leave higher educational institutions in any particular year are referred to as "higher educated manpower cohorts" of that year.

16. For purposes of organising manpower-planned development of higher education we have, first of all, to plan the growth of the "stock" of higher educated manpower. The annual additions which are needed to enable the planned growth of stock to take place will be the demand for higher educated man-power cohorts. It is therefore very important that the distinction between the "cohort" and the "stock" should be clearly borne in mind.

17. The distinction between the "higher educational cohort" and the "higher educated manpower cohort" as just now defined, has also got to be borne in mind in passing over from manpower planning to educational planning.

The "Higher Educational Cohorts" represent what may be regarded as the "gross out-turn" of the organised system of higher education in the country. The "Higher Educated Manpower Cohorts" represent what may be regarded as the "Net Out-turn" of the system.

18. Manpower-Planned Development of Higher Education is the process by which the productive capacity of higher educational institutions (assessed in terms of numbers of higher educated manpower cohorts of different levels, sub-levels, types and other detailed classification) is developed from year to year so as to keep pace with the rate of growth of demand for such manpower cohorts for first employment in the entire national economy. (It may be observed, in passing, that the national educational system forms one of the major sources of demand for higher educated manpower cohorts, besides being the only source of supply of such cohorts).

Manpower-Planned reform of higher education consists in the planned adaptation of the organization, administration, management and operation of higher educational institutions to the foregoing process of development.

SECTION 4. THE CONCEPTS OF "FINAL TARGET YEAR", THE "INTERIM TARGET YEAR" AND "CONTROL FIGURES"

19. Reference was made in Chapter I to the "Interim Target Year". By implication, there must be a "Final Target Year", though this is not part of the Higher Educational Perspective Plan-Frame of which a draft has been put forward. What does this mean? We have undertaken a succession of five year plans, completed three of them, and propose to continue the series until the national economy attains sufficient maturity to be compared with the economy of the industrially developed countries of the world. The attainment of the stage of development can be defined by several characteristics. One of them with which we are directly concerned, is that the national educational system should be so developed that our children will enjoy the same educational opportunities as other countries do today. When will that be? Whenever it may be, the year in which that is expected to happen is our "Final Target Year".

20. It is easily demonstrable (and it has been demonstrated) that the development of the national educational system up to the stage thus defined cannot be completed within the Fourth, Fifth or Sixth Plan Periods. It is possible to attain that stage in some year during the Seventh Plan Period, provided one important precondition is fulfilled. The pre-condition is that the national birth-rate should have been reduced to parity with the present birth-rate of Japan and the Western European Countries at least a few years earlier.

21. Why do we define the end-year of the time-horizon of our Perspective Planning in this way rather than in the customary way of specifying a firm date, say, 1985-86? We prefer to do so because the customary procedure usually ends in presenting a superficially attractive blue-print of fulfilment of our hopes, which does not, however, serve as a proper guide for necessary action. On the other hand, it reinforces the normal human tendency to gloss over the difficulties to be overcome and the efforts to be made before planned targets are attained.

22. Whether the end-year of the Perspective Plan is fixed or moveable, it is in either case too far away for the formulation of a Perspective Plan-Frame, which would serve as a guide for individual schemes during the next few years. For this purpose, we have to consider the first phase of the Perspective Plan as ending in a near enough date. To this end, calculations have been made with 1975-76 as the end-year of the first phase. These calculations depend on certain assumptions (which will be specified in the next chapter) about the rate at which the production of goods and services will grow in the national economy. The need for higher educated manpower will grow, as planned, only in so far as this assumption of economic growth is realised. Whether or

not this is realised depends in part on the extent to which every one in the nation does his duty, and in part also on what other nations do. Recent experience is crucially relevant.

23. *It is, therefore, proposed in this report to define the Interim Target Year as that year in which the net domestic non-farm product rises above* 17,000 *crores of rupees at constant* (1960-61) *prices*. The choice of this particular figure is explained in the next chapter. We assume provisionally that the interim target year, as thus defined, will arrive in 1975-76. But we make no firm promises to any one that it will so arrive; as that, again, depends on the rate of growth of industrialisation. This, as recent events have shown, is subject to uncontrollable influences. We can only do our best to develop the economy steadily from year to year. Doing that, we have to keep on verifying whether the actual growth of the net domestic non-farm product turns out to be more or less rapid than was assumed. We should be ready to revise our assumption (if need be) and to accelerate or retard our schemes accordingly. It is, necessary to emphasise the conditional nature of specific figures contained in the Perspective Plan-Frame, as a corrective to the normal human tendency to remember figures and forget conditions.

24. Finally, a word about the use of the term "Control Figures". The word "Target" suggests something which it would be difficult to attain but is, nevertheless, planned to be attained. There is a further suggestion that it would be a meritorious thing to exceed the target. This is true in respect of certain objectives, but not of others. In other cases, what we need is a planned figure, which we have to restrain ourselves from exceeding. In planning the development of higher education, the general problem is not how to increase numbers but how to improve quality and utility; and how, to that end, actually to restrain the unduly rapid growth of numbers now occurring in many types of higher education. Thus, we need "ceilings" in some cases and "targets" in others. We use the expression "Control figures" as the common designation for both targets and ceilings.

CHAPTER III. THE PROBLEM 'OF EDUCATIONAL INFLATION', A STATISTICAL STUDY AND LESSONS FOR PLANNING

SECTION 1. PRELIMINARY REMARKS

25. The object of this chapter is to explain the meaning, purpose and implications of the 'control figures' for planned growth of the national stock of higher educated manpower between 1960-61 and the Interim Target Year. These are reproduced in Table 1 below:

TABLE 1. GROWTH OF THE NATIONAL STOCK OF HIGHER EDUCATED MANPOWER

(Numbers in lakhs)

Employment Categories of Higher Educated Manpower	Computed Actuals (1960-61)	Planned Growth o National Stock of Higher Educated Manpower (Proposed) Control Figures Interim Target Year
1	2	3
Industrial Employment	1·91	11·00
Service Employment	10·04	22·00
TOTAL NON-FARM EMPLOYMENT	11·95	33·00
Farm-Home Employment	1·42	4·00
Employment Seekers	0·95	3·00
MANPOWER STOCK TOTAL	14·32	40·00

26. The 'employment categories' referred to in the foregoing table are defined below:

(a) "Farm-Home Employment" means employment in farming, household industry, and housewifery. "Farming" includes not only agriculture proper, but also animal husbandry, forestry, fishing and hunting.

(b) "Industrial Employment" means employment (otherwise than by way of household industry) in the extraction of minerals; production of manufactured products; generation and distribution of electricity; and construction of buildings, roads and other works. All employees of establishments in which such industries are carried on are included in "Industrial Employment" irrespective of the occupational classification of their work. It may be added that "industrial employment" as now defined does not include employment in what are sometimes referred to as "Service Industries" *e.g.*, transportation and communications.

(c) "Service Employment" means any employment other than "Farm-home employment" or "industrial employment". It includes employment in Government Administration, Commerce, Transportation, Communications, Education, Health, Welfare and other social, cultural and personnel services.

(d) All persons included in our definition of manpower who are not engaged in any of the three foregoing categories of employment are referred to as "employment seekers".

27. In order to explain the rationable of the "control figures", it is necessary to undertake a detailed study of the basic problem which the national educational system is facing today. This problem has been referred to already as "educational inflation". Higher education has, of course, an intrinsic cultural value; people no doubt understand this but they take it for granted. The pupils who seek admission to higher educational institutions (and more especially their parents) are much more interested in the pecuniary value of higher education. The demand for admission to higher education is really a demand for what may be described as "higher educational employment". Similarly the demand for admission to secondary education is a demand for those certificates which constitute the necessary qualification for admission to higher education as well as what may be described as "Secondary Educational Employment".

28. During the last fifteen years, the supply of higher educational employment as well as secondary educational employment has increased from year to year at a faster rate than ever before. But, at the same time demand has grown even faster. Seats in secondary schools and colleges have increased in number from year to year in response to this rapidly growing demand. The annual out-turn of educated manpower cohorts has grown faster than the supply of higher educational employment as well as secondary educational employment.

29. When this happens, the chances of pupils who secure higher educational awards getting higher educational employment get diminished. In increasing numbers they have to be contented with secondary educational employment. Normally this ought to have the effect of diminishing the pressure of demand for admission to higher education. But it does not have that effect. It has, in fact, the contrary effect. For, the out-turn of secondary educational cohorts is growing even faster. These cohorts are looking forward to admissions to higher education as their first objective. They will settle down to secondary educational employment only when admission is denied to them. Their eagerness to gain admission to higher education is intensified when they find that even secondary educational employment becomes hard to get because of competition from higher educational cohorts. The inflationary spiral (so familiar in the market for essential commodities), thus extends to the educational field.

30. Inflation is an insidious disease. When it starts, people like it, as it profits a good many people and seems to do little harm to others. It is only when inflationary pressure has established itself that its harmful features become clear. This is what has happened to the economy as a whole. It is only now realised that economic inflation has got to be at least contained (if not altogether overcome) if planned economic development is to go forward without an economic breakdown. Similarly it is also necessary to contain the growth of educational inflation, if manpower-planned development and reform of higher education is to have any chance of success. It is, in fact, necessary to avert a breakdown of the national educational system.

The "Control figures" proposed in Table 1 imply the acceptance by the responsible authorities of this appreciation of the present situation about educational inflation.

31. The sections which follow are intended to carry conviction about the correctness of this appreciation. We present a statistical study of the national stock of not only higher educated manpower but also secondary educated manpower. We forecast the future growth of this stock on the basis of present trends; and compare this growth with the probable future growth of secondary educational employment and higher educational employment. This comparison brings out clearly the future rate of growth of educated unemployment. It is then suggested that this anticipated growth must be prevented; and to that end "educational inflation must be contained." Suggestions are then offered about practicable measures which may be adopted in order to achieve such containment.

SECTION 2. ECONOMIC GROWTH ASSUMPTION

32. Neither educational planning nor manpower planning can be limited to the short period covered by one five year plan. It is of the essence of such planning that decisions have to be taken before the commencement of one five year plan period about action to be taken during that period, in order adequately to prepare for meeting the needs of a longer period, including at least the next succeeding five year plan period. Such decisions have to be taken in advance, knowing perfectly well that the likely growth of the economy over such a long period cannot be predicted confidently; and knowing that, even where reasonable

grounds for such prediction exist, they may be invalidated by unforeseen and unforeseeable changes in conditions affecting the growth of the economy.

33. This difficulty is inescapable. It has got to be accepted; and predictive assumptions have got to be made by the exercise of the best possible practical judgement on the basis of all available data, however incomplete and however defective they may be. The assumptions underlying the practical judgement so made have got to be kept under constant review in the light of the facts of economic growth as they actually emerge. The planners have to be prepared, if necessary, to modify the assumptions and make consequential changes in planned programmes. The programmes have to be so framed and the administrative machinery for their implementation so organised that the needed changes can be decided upon and given effect to smoothly without causing any dislocation of the arrangements for implementation of planned programmes. Our administrative machinery for planning and development is not yet developed to the extent indicated by these requirements. We assume that the administrative machinery will be reformed and improved over the whole field of planned development generally, and the educational field in particular.

34. We shall now set out the predictive assumptions on which we propose to proceed further. They are shown in Table 2. For a detailed explanation of the justification for making the foregoing assumptions (in preference to somewhat more optimistic assumptions which were officially put forward some time ago), reference may be made to IAMR Working Paper No. 12/1965. It is possible to hold, in the light of very recent experience, that the growth of the economy which is assumed to be reached in 1975-76, might not be reached in that year. We assume, however, that the forecast will not be far out; and that (at worst) the assumed production of 1975-76 will be reached two or three years later.

TABLE 2. GROWTH OF THE SEASON-ADJUSTED NET DOMESTIC PRODUCT (IN CRORES OF RUPEES AT CONSTANT 1960-61 PRICES)

Plan-Final Year		Total Net Domestic Product	Net Domestic Non-Farm Product	Net Domestic Product of Organised Industries
1		2	3	4
1955-56	(I)	11,690	5,790	930
1960-61	(II)	13,980	7,300	1,480
1965-66	(III)	17,010	9,350	2,750
1970-71	(IV)	21,280	12,510	4,840
1975-76	(V)	27,370	17,330	8,370

35. *It is proposed to refer to that year in which the Net Domestic Non-Farm Product first exceeds* 17,000 *crores of rupees at constant* 1960-61 *prices as the "Interim Target Year"*. Our targets and control figures of the "Growth Perspective Plan-Frame" must be related to the "Interim Target Year" as thus defined. We should plan our programmes on the assumption that they are to be completed in the year 1975-76, which is provisionally identified as the "Interim Target Year". If, in the course of execution of the programme, the economy is observed to grow more slowly, the completion of the programme may be retarded correspondingly. If (as is conceivable, though hardly possible) the economy grows faster, the completion of the programme can also be advanced correspondingly. With this explanation, we may dismiss from our mind an otherwise unavoidable controversy about the appropriateness of the assumptions set out in Table 2; and, therewith, all doubts about the utility of perspective planning.

SECTION 3. EDUCATIONALLY CLASSIFIED PERSONS 1960-61

36. Towards the end of the year 1960-61 (the final year of the Second Five Year Plan Period), the total strength of the national stock of educationally classified persons was 82.29 lakhs. For a nation which already numbered 4,392 lakhs at that time, this was, obviously, a very meagre stock. And yet, as we shall see, this small number

included too many educated employment seekers. Among these 82·29 lakhs educationally classified persons, 66·76 lakhs were secondary educated and only 15·53 lakhs were higher educated (even according to the 'devalued' definition of higher education on which we are proceeding).

37. It is estimated that the national stock of educationally classified persons included, at one end of the scale, 13·01 lakhs of pupils enrolled in educational institutions, and at the other end of the scale, 2·00 lakhs of persons aged 60 and above. Deducting 13·01 lakhs on account of these two categories, there were 67·28 lakhs who were available for employment, and constituting the national stock of educationally classified manpower. Within this total, there were 14·32 lakhs of higher educated manpower and 52·96 lakhs of secondary educated manpower.

38. How many of them were engaged in each of our three categories of employment? And how many were employment seekers? This is shown in Table 3 below.

TABLE 3. EMPLOYMENT PATTERN OF EDUCATIONALLY CLASSIFIED MANPOWER (1960-61)

(Numbers in lakhs)

Employment Category	Higher Educated Manpower	Secondary Educated Manpower	Educationally Classified Manpower
1	2	3	4
Industrial and Service Industries . . .	1·91	5·91	7·82
Employment Services	10·04	28·09	38·13
TOTAL	11·95	34·00	45·95
Farm-Home Employment	1·42	10·36	11·78
Employment-Seekers	0·95	8·60	9·55
Manpower (TOTAL)	14·32	52·96	67·2

39. The employment pattern disclosed by the figures in Table 3 conforms generally to what may be expected on general grounds. The following comments may be made.

(a) Organised industries which are expected to grow rapidly and consequently offer scope for rapid increase of employment, provide only a relatively small proportion of aggregate employment. The proportion was less than one-seventh in 1960-61. Thus, the industrial base from which we start in 1960-61 is very narrow. Services employ nearly five times as many higher educated and secondary educated persons as organised industries.

(b) Farm-home employment occupies a small but nevertheless significant segment of educationally classified manpower. Though it is not shown in the table, it may be mentioned that housewifery accounts for about one-half of the total. The other half is mostly accounted for by farming. Household industry accounts for a very small number.

(c) The number of "employment-seekers" is very nearly 10 lakhs. This figure has been arrived at by an entirely new mode of reckoning and it tallies satisfactorily with official estimates made earlier on the basis of very different data.

40. A total of nearly 10 lakhs of educated employment-seekers is a disquietingly large number when compared with a total of 46 lakhs of educationally classified manpower in organised industrial and service employment. It is a large number even when compared with the total of 57 lakhs, the number settled in all kinds of employment including farming, household industry, and housewifery. It should, however, be remembered that the employment-seekers consist mainly of educated manpower cohorts (who have left school or college and are looking out for suitable employment).

A certain number of employment-seekers is, therefore, normal and necessary. Further, it is also normal and necessary that this number should increase from year to year alongwith the increase in the annual out-turn of educated manpower cohorts. This normal and necessary phenomenon becomes a social problem only when the relative proportion of educated employment-seekers to educated manpower cohorts is either unduly high, or increasing unduly rapidly. The calculations show that *the total number of secondary educated employment-seekers is just about twice the number of secondary educated manpower cohorts in the previous year, while the total number of higher educated employment- seekers is rather less than the total number of higher educated manpower cohorts in the previous year.*

41. It is useful and convenient to express the relative proportion of educated employment-seekers to educated manpower cohorts as an interval which may be called the "average waiting period" between leaving school or college and settling down to some employment (including formal apprenticeship). For a pupil who has completed secondary education and entered the employment market without proceeding to or completing higher education, this "average waiting period" was 104 weeks in 1960-61. For a pupil who entered the employment market after completing higher education it was 45 weeks.

42. Ideally, all educationally classified persons entering the employment market ought to be able to settle down in employment at different times during the course of one year and before the next batch of employment-seekers arrive from the schools and colleges. Ideally, therefore, an average waiting period of not less than 26 weeks and not more than 52 weeks is indicated. Within these limits, a somewhat longer period is a good thing for would-be employers; and a slightly shorter period is good thing for employees, and self-employed persons. An average waiting period of 45 weeks for higher educated employment-seekers falls within these limits. It is not excessive though tending to be on the high side. An average waiting period of 104 weeks for secondary educated employment-seekers is very much on the high side.

43. The foregoing numbers, let it be remembered, are global averages for the country as a whole. As such, they are likely to present a somewhat over-optimistic picture, especially about higher educated employment-seekers. Unemployment of educationally classified manpower is not evenly spread out over all districts of all States of the country. There are a great many districts which present no problem for the very unsatisfactory reason that they are educationally too backward to present a problem. There are also quite a few districts which present no problem for the very satisfactory reason that they are progressing with equal rapidity, economically as well as educationally. If we exclude these two extremes the remaining districts would be fairly typical of the country as a whole. A study of the average waiting period for only those districts in which education is growing at a faster rate than organised industrial and service employment, is likely to show that the average waiting period for the secondary educated employment-seeker is longer than the global average of 104 weeks, which is bad enough. The position about higher educated employment-seekers will also be seen to have become a problem in parts of the country.

44. In planning the further development of education, we must make sure that we shall not be aggravating this problem of educated unemployment. The relative size of employment-seekers, measured by this "average waiting period" must be an important "control figure" in our plans. *It should be kept down to a pre-planned average for the country as a whole; it should not be permitted to rise above a pre-planned maximum limit in any district of any State in the country.* Obviously, this objective cannot be attained merely through action taken within the campus of educational institutions. It has to be paralleled by action to be taken also by the Government departments, enterprises and institutions which employ educationally classified manpower (including educational institutions which are employers of educationally classified teaching manpower). This is how and why educational planning and manpower planning have got to be coordinated. We should bear this prime requirement in mind, as we proceed to cast our eye on future years up to 1975-76 and estimate the probable growth up to that year and the pattern of employment during that year.

SECTION 4. TREND-BASED GROWTH UP TO 1975-76

45. All the pupils who are likely to become secondary educated persons or higher

educated persons during the next ten years are already enrolled in the schools and colleges of the country. The Ministry of Education of the Government of India compiles and publishes detailed and reliable data about the numbers of such pupils. As a time-series of such data is available over a long enough period, it is possible to determine the trend of growth in the annual outturn. Reasonably reliable prediction of future supply on the basis of continued operation of present trends is thus possible. The necessary studies have been made and Table 4 below shows the figures of probable growth in the national stock of educationally classified persons and manpower.

TABLE 4. TREND-BASED GROWTH OF NATIONAL STOCK OF EDUCATIONALLY CLASSIFIED PERSONS AND MANPOWER

(Numbers in lakhs)

Plan Final Year	Educationally Classified Persons	Deduct		Educationally Classified Manpower
		Persons aged 60 and above	Pupils Enrolled in Educational Institutions	
1	2	3	4	5
1960-61 (II)	82.3	2.0	13.0	67.3
1965-66 (III)	118.9	2.9	17.0	99.0
1970-71 (IV)	180.4	4.1	26.4	149·9
1975-76 (V)	276.3	6.8	40.2	229·3

46. For purposes of forecasting the probable growth of employment of educationally classified manpower in organised industries and services, we make the following assumptions:

First. That employment will grow in organized industries in proportion to the growth of the net product of organised industries.

Secondly. That employment will grow in services at the same rate as the entire net non-farm product (inclusive of organised industries). This would be faster than the growth of the net product of services alone. We have to proceed on the basis of these assumptions as no better basis is at present available.

47. But this difficulty need not persist for ever. We can and should undertake one simple and practicable measure in order to secure "educationally classified employment returns"; and on the basis of these returns prepare and publish "Educationally Classified Manpower Tables" as a regular annual series of basic planning information. We should organise systematic study of the information thus made available and prepare and publish computed actuals and forecast estimates of rates of growth of employment, not only by major heads and sub-heads, but also by minor heads and detailed heads of educational classification. As part of such study, we should test the correspondence between empirical assumptions about relationship between growth of employment and growth of the economy. We should, progressively, bring about such modifications and refinements in these assumptions as are shown to be necessary. If we do this, it should be possible, before the end of the Fourth Plan period, to perfect the technique of forecasting the trend of requiremnets as well as supply. The decision can then be taken for establishing a planned balance between supply and requirements. It may be observed, in passing, that an organization which is necessary for and capable of doing this work has already been brought into existence as the Institute of Applied Manpower Research.

48. Proceeding, as we must, on the basis of the assumptions we have chosen to make, the results in terms of the probable position in 1975-76 are shown in Table 5.

49. Table 5 tells us that organised industries and services will absorb 135 lakhs of educationally classified persons in 1975-76 (assuming, of course, that the economy behaves according to forecast and the Interim Target Year is not delayed beyond 1975-76). This would mean an almost exactly threefold increase between 1960-61 and 1975-76. We have seen already (*vide* Table 4) that there would be 229 lakhs of educationally classified manpower available for employment in 1975-76. If 135 lakhs are employed in organised industries and services, the remaining number *viz.*, 94 lakhs, would have either settled down to Farm-Home employment or would be seeking work.

TABLE 5. FORECAST OF EMPLOYMENT OF EDUCATIONALLY CLASSIFIED MANPOWER (1975-76)

(Numbers in Lakhs)

		Educationally Classified Manpower
1		2
Organised Industries	Higher Educated	10.8
	Secondary Educated	33.4
	TOTAL	44.2
Services	Higher Educated	23.8
	Secondary Educated	66.7
	TOTAL	90.5
Organised Industries and Services	Higher Educated	34.6
	Secondary Educated	100.1
	TOTAL	134.7

50. How many would be settled down contentedly in farms and homes? This was less than 12 lakhs in 1960-61 when organised industries and services absorbed 46 lakhs. Will farms and homes be more attractive to educationally classified manpower in 1975-76 than in 1960-61? We may fairly suppose that the number of educationally classified persons settling down contentedly as housewives will grow as fast as the total stock of educationally classified manpower. But the same cannot be said about farming or household industry. Let us assume, nowever, that the total numbers employed in farms as well as homes will have grown three-fold between 1960-61 and 1975-76. We thus assume that the number settled in farm-home employment would be 35 lakhs. We *are left with 59 lakhs, as the figure of employment-seekers in* 1975-76.

51. We have seen already that the number of employment-seekers in 1960-61 was under 10 lakhs. That was already too high; and was recognised as a social problem. We see now that while the number settled in employment increases (three times) from under 58 lakhs to 170 lakhs, the number of employment-seekers increases (six times) from under 10 lakhs to 59 lakhs. The proportion of employment-seekers to employed persons increases from about one-sixth to one-third. Whereas in 1960-61 employment-seekers had an "average waiting period" of 92 weeks, this will have increased to 137 weeks in 1975-76.

52. This "average waiting period" of 137 weeks (as we should remind ourselves again) is the global All-India average. It would be unrealistic to assume that regional imbalances between educational progress and economic growth would have disappeared or even substantially diminished by 1975-76. As a result, the All-India "average waiting period" of 137 weeks, may well be reflected in much longer waiting periods in many regions of the country. The figures leave no room for doubt that unless planned remedial measures are taken in time, tne social problems created by educational inflation may become unmanageable.

SECTION 5. POSSIBLE OBJECTIONS AND ANSWERS THERETO

53. The conclusion about educational inflation reached at the end of the last section may be regarded by many as a (somewhat superfluous) statistical confirmation of common sense. But there is need for such confirmation. The need exists, not because there is any real doubt about the validity of the conclusion, but because the remedial measures to which that conclusion points are unpalatable and will provoke resistance. The resistance will take many forms. As the more important of these forms of resistance, we may confidently anticipate objections to the premises and reasoning on which the conclusion rests. It is necessary to foresee these objections and answer them in advance.

54. Here is a statement of possible objections:

(a) It is admited that statistical data are incomplete and defective. It would be wrong to make major changes in the working of the educational system on the basis of a conclusion resting on such data;

(b) The assumption made about the growth of the economy as well as of the relationship between the growth of the employment and the growth of the economy are unduly pessimistic. Employment will grow more rapidly than the projection figures indicate;

(c) Even granting that the foregoing assumptions are correct, it is a mistake to assume that only those posts in industrial and service establishments which were actually held by higher educated persons and secondary educated persons could have been so held. In many sectors of employment, notably in industries, there was an acute shortage of qualified manpower. If allowance were made for this shortage before projections are attempted, it will be seen that the educationally classified manpower anticipated to be available in 1975-76 will be fully employed; and

(d) Even supposing that there would be surplus of higher educated and secondary educated manpower, there is need for any number of such persons in farming and household industry. The "social problems" can be easily exaggerated. We ought to go ahead and produce as large a surplus as we can.

55. The first of the four foregoing objections may be disposed of summarily. If policies and plans are to be deferred until the needed statistics are perfected, they will have to be deferred to the Greek Kalends. Statistics do not get perfected *in vacuo*. They get perfected only in the process of being studied and purposefully used in order to settle policies, plans and programmes and in order to watch and control the implementation of planned programmes. The Governmental authorities who are responsible for deciding on policies and plans have no escape from the necessity of basing their decisions in the last resort on their own good practical judgement. Research studies of statistical data are, indeed, necessary. They are all the more necessary when the data are incomplete and defective. But the results of such studies can only assist the formation of good practical judgement; they cannot be a substitute for it.

56. The same considerations apply, with even greater force, to the second of the four objections. We are obliged to form a view about the rate of growth of the economy ten years hence, in order to take practical action during the next five years, and to take decisions about such action here and now. We have to make assumptions. There is no escape from that necessity. If there are alternative assumptions to choose from, it is for the responsible authorities to make the choice after taking into account all the relevant considerations, and accept responsibility for the results of the choice made by them. The assumptions which we have made can be more justly criticised as over-optimistic than being pessimistic.

57. The last objection may also be easily met. There is no doubt whatever that the economy can be benefited by a substantial increase in the number of educationally classified persons employed in farms and homes. But, before this benefit can be actually realised we must have educational curricula which are adapted to secure that result. We must have teachers who are competent to teach these curricula, and we must have pupils who appreciate the value of such curricula and exert themselves in order to secure the benefit. None of these conditions exists now. They have to be and should be brought into existence. But this cannot be done without counting the cost and estimating numbers. And it does not affect the conclusion about whither the present draft must lead.

58. It is the third among the four objections which does contain an element of validity and does require careful study. It is true that the data needed for the study are not available. However, an attempt has been made to study the limited amount of information already available, and the results are set out in Table 6.

TABLE 6. EMPLOYMENT OF EDUCATIONALLY CLASSIFIED MANPOWER COMPARED WITH LISTED (EDUCATIONALLY CLASSIFIABLE POSTS: (1960-61)

(Numbers in Lakhs)

Employment of Educationally Classified Manpower			Listed Posts		
1	2	3	4	5	6
I. Industrial Employment	Higher Educated Manpower	1·9	I. Industrial Establishments	Higher Educational Posts	2·3
	Secondary Educated Manpower	5·9		Secondary Educational Posts	7·5
	TOTAL	7·8		TOTAL	9·8
II. Service Employment	Higher Educated Manpower	10·0	II. Service Establishments	Higher Educational Posts	7·2
	Secondary Educated Manpower	28·1		Secondary Educational Posts	27·1
	TOTAL	38·1		TOTAL	34·3
III. Industrial and Service Employment	Higher Educated Manpower	11·9	III. Industrial and Service Establishments	Higher Educational Posts	9·5
	Secondary Educated Manpower	34·0		Secondary Educational Posts	34·6
	TOTAL	45·9		TOTAL	44·1

59. The figures on the left hand side of Table 6 are taken from Table 3 and require no explanation. The figures on the right hand side of Table 6 are based ultimately on two sets of occupational returns, one relating to all public sector establishments in September, 1962, and the other relating to all reporting private sector establishments in September, 1963. The manner in which the data contained in these returns have been used is set out below:

First. Every "occupational family" (classified by a three-digit code number) was looked into and an *ad hoc* judgement made as to whether the posts concerned are or are not "educationally classifiable" and if they were, whether they are classifiable as "higher educational posts" or "secondary educational posts".

Secondly. The educationally classifiable posts, as thus determined, were separately listed for industrial establishments and service establishments. The listed posts were totalled; and allowance was made (on the basis of assumptions already stated) at separate rates for the two lists, for assumed growth between 1960-61 and 1962-63.

The resulting figures are the "computed actuals" for the aggregate of all establishments and they are shown on the right hand side of Table 6.

60. To begin with, it should be carefully noted that we are comparing figures which were not only arrived at by different methods of computation but which relate, in fact, to two quite different items altogether. The figures on the left hand side relate to "classified persons" while the figures on the right hand side relate to "listed posts". Posts listed as "Higher Educational Posts" are posts of which the functions are such that they should be performed, ordinarily, by higher educated persons. It does not, necessarily, follow that all higher educational posts were filled only by higher educated persons. Likewise it must be borne in mind that some among the listed secondary educational posts could have been filled by higher educated persons, some others by secondary educated persons, and yet others by educationally unclassified persons. One other fact to be borne in mind is that there is a certain amount of private employment in units which are classified neither as households nor as reporting establishments. Figures relating to persons in such private employment are included on the left hand side of Table 6, but have no counterpart on the right hand side.

61. If we bear the foregoing considerations in mind, the broad dimensional parity which is observable between the figures on the two sides of Table 6 is a gratifying indication

of the reliability of the basic data under study. We may, therefore, draw important inferences from the comparison of figures in Table 6. These are set out below:

First. There were 46 lakhs of educationally classified persons and 44 lakhs of listed posts. The difference is small and may be set off against private non-household employment which remains unreported.

Secondly. There were about 9.8 lakhs of listed posts in industrial establishments against 7.8 lakhs of educationally classified persons in industrial employment. It looks as if, at least 0.4 lakhs of higher educational posts (out of 2.3 lakhs) were held by secondary educated persons; and 2.0 lakhs of secondary educational posts (out of 7.5 lakhs) were held by educationally unclassified persons. If allowance were made for unreported non-household employment, the net proportion of listed posts held by educationally underqualified persons will turn out to be even larger.

Thirdly. The pattern of employment in service establishments appears to be the opposite of the pattern of employment in industrial establishments. There were 34.3 lakhs of listed posts in service establishments and 38.1 lakhs of educationally classified persons in service employment. It looks as if at least 2.8 lakhs of higher educated persons (out of 10.0 lakhs) held secondary educational posts; while 3.8 lakhs of secondary educated persons (out of 28.1 lakhs) held unlisted posts for which even secondary educational qualifications were unnecessary. If allowance were made for unreported non-household private employment, it is likely that the net proportion of under-employment of educationally classified persons would be somewhat smaller; but not perhaps very much smaller.

62. Once again, we find that the statistical data tend to confirm the opinion generally held about the deployment of higher educated manpower and secondary educated manpower in industrial establishments and service establishments. Do these data justify us in assuming that the scope for employment (in all industries and services taken together) of higher educated persons and secondary educated persons will be substantially larger in 1975-76 than what the projected figures of Table 5 indicate? If that is so and if we can put a figure on the increase to be allowed on this account, we may have to deduct that figure from our estimate of the potential number of employment-seekers in 1975-76. The answer to the question thus raised is, however, a matter for practical administrative judgement; it is not a simple matter for statistical computation.

63. The relative proportion of higher educational posts held by secondary educated persons in industrial establishments is not excessive; very probably, it reflects a correct preference on the part of employers for educationally underqualified persons with adequate practical experience as against educationally qualified persons with inadequate practical experience. In forming an opinion on this point we should bear in mind that "sub-professional diploma holders" as well as holders of university degrees are included in our definition of higher educated persons. Our efforts to adapt the educational system to provide manpower suitable for industrial establishments are still in an early stage.

64. Our projections call for a very rapid growth of employment of higher educated persons in industrial employment (from 1·9 lakhs to 10·8 lakhs). Though our institutional capacity has increased adequately, the process of adaptation to industrial needs and organisational linkage with industry has scarcely begun. Therefore, it is going to be extremely difficult to reach even up to 11 lakhs. In particular, it will not be reached unless we succeed in developing "promotional-extension-education" for secondary educated manpower in industrial employment, an entirely new departure yet to be undertaken. We shall be wise, therefore, to proceed on the assumption that industrial employment of higher educated manpower is unlikely to exceed 11 lakhs in 1975-76. This is the figure adopted in the higher educational perspective plan-frame.

65. Net under-employment of higher educated manpower in service employment is so large that we should not project it without change to 1975-76. At the same time it will be very unwise to plan any material reduction, because this will only add to the number of higher educated employment-seekers, the avoidance of which has overriding priority. We have, therefore, budgeted only a token cut from 24 lakhs to 22

lakhs in our trend-based projections of higher educated employment in services. This is the figure adopted in our higher educational perspective plan-frame.

66. The trend-based forecast for industrial employment of secondary educated manpower is 33 lakhs in 1975-76 (as against 6 lakhs in 1960-61). There is, certainly, good scope for increasing this number. The supply of secondary educated manpower cohorts is abundant. The industrial training institutes and the Apprentice Act provide the means by which the necessary training can be provided in order to fit the secondary educated persons for industrial employment. But there are a large number of practical difficulties which require to be overcome. These difficulties are closely connected with the regional imbalances in educational progress and industrial development. Surpluses of secondary educational cohorts are thrown up in districts which are far removed from districts where secondary educational employmnt is growing rapidly. There are language difficulties adding to the difficulties of distance. Young men in search of employment are overcoming these difficulties to some extent. They can be given more purposive assistance than they get at present. We presume this will be done and we put a figure of 7 lakhs as possible addition to the trend-based forecast and budget for 40 lakhs of secondary educated manpower in industrial employment in 1975-76.

67. As regards secondary educated manpower in service employment, it would be unwise to plan a higher level of employment than the figure indicated by trend-based projections (about 91 lakhs), since we are assuming that higher educated persons will continue to occupy much the same proportion of secondary educational posts, as at present, and since we know that there is already some measure of underemployment.

68. We embarked on the enquiry into the possibilities of industrial and service employment of educationally classified manpower in 1975-76, with a view to determine whether our trend-based figure for such employment (*viz.*, 135 lakhs) can be improved upon. Our answer is that this can be improved upon; but only marginally. If, at the same time, we are also determined that the number of employment-seekers should be kept down to a pre-planned figure there is no escape from the conclusion that we must try to control the expansion of educational capacity which is now taking place in response to demand. The control should be sufficient to ensure that the number of educational cohorts of each year will not exceed year after year the possible supply of employment of the nature which they seek and for which they are educationally prepared. With this end in view we have to plan "ceilings" for the year 1975-76, in respect of the total number of educated employment-seekers as well as for the entire national stock of educationally classified manpower.

69. Here we encounter the final difficulty. The educational progress is uneven as already noted and the problem of educational inflation is not the same in different parts of the country. There are areas where the expansion of the capacity of educational institutions has still got to be stimulated. These areas will continue to produce increases in the national stock. The problem areas have to be identified and control measures, which cannot be the same for different areas or different levels, will have to be devised and implemented. It is precisely in these areas where the pressure is great that the practical difficulties of exercising control are also very great. It follows that with the best will in the world, it will not be possible to make any impression on the trend-based growth until sometime in the fifth plan period. Nor will it be possible to reduce the additions to the stock during the fifth Plan period by more than a fraction of the additions which can be foreseen as likely to occur in that period according to present trends.

70. It is in the light of these considerations that we have to fix a practicable ceiling, (not a target), for the national stock of educationally classified manpower during 1975-76. Within this ceiling we have to plan the size of the national stock of higher educated manpower and secondary educated manpower and their distribution in the major categories of employment.

71. The net results of the foregoing considerations are set out in Table 7 which shows the proposed control figures for planned growth of the national stock of higher educated manpower.

TABLE 7. PLANNED GROWTH OF EDUCATIONALLY CLASSIFIED MANPOWER—PROPOSED CONTROL FIGURES

(Numbers in Lakhs)

	Computed Actuals 1960-61			Control Figures Proposed for Interim Target Year		
	Higher Educational Manpower	Secondary Educational Manpower	Educationally Classified Manpower	Higher Educational Manpower	Secondary Educational Manpower	Educationally Classified Manpower
1	2	3	4	5	6	7
National Stock (TOTAL)	14·3	53·0	67·3	40·0	178·0	218·0
Industrial Employment	1·9	5·9	7·8	11·0	40·0	51·0
Service Employment	10·0	28·1	38·1	22·0	69·0	91·0
Industrial and Service Employment (TOTAL)	11·9	34·0	45·9	33·0	109·0	142·0
Farm-Home-Employment	1·4	10·4	11·8	4·0	47·0	51·0
Employed (TOTAL)	13·3	44·4	57·7	37·0	156·0	193·0
Employment-Seekers	1·0	8·6	9·6	3·0	22·0	25·0

The figures in the foregoing table so far as they relate to higher educated manpower are those which have been adopted in the higher educational perspective plan-frame.

72. The lessons for planning which emerge from this discussion may be briefly recapitulated:

First. It is necessary to keep a watch on the growth in the number of employment-seekers and the relationship between this number and the number of educated manpower cohorts. We must ensure that the number of employment-seekers does not exceed a pre-planned ceiling figure. The figure proposed for 1975-76 is 3 lakhs for higher educated employment-seekers and 22 lakhs for secondary educated employment-seekers;

Secondly. If the objective is to be secured, it is necessary that there should be an over-*all ceiling for the national stock of educationally classified manpower.* It is proposed that this ceiling should be 218 lakhs during 1975-76 divided into 40 lakhs for higher educated manpower and 178 lakhs for secondary educated manpower;

Thirdly. Within these ceiling figures, it will be necessary to plan a very rapid growth in industrial employment which will need not merely measures for expansion of capacity but other measures for reform of the operation of the educational system;

Fourthly. Again, it will be necessary to make provision for a substantial increase in the national stock to be employed in farms and homes. This will not come about by trend-based growth. Specific measures of reform of the educational system will have to be planned and implemented so as to secure this result; and

Fifthly. Service-employment will continue to be the most important sector of employment of educationally classified manpower. The continuance of what is at present regarded as under-employment in services is to be expected and accepted. Reforms have to be carried out in the educational system so as to provide the most suitable educational preparation for such employment.

CHAPTER IV. PROPOSED GROWTH OF THE NATIONAL STOCK OF HIGHER EDUCATED MANPOWER AND MAJOR OCCUPATIONAL GROUPS THEREOF

SECTION 1. EMPLOYMENT CATEGORIES

73. The object of this chapter is to explain (in continuation of the last chapter) the meaning, purpose and implications of the statement which forms Part I of the (Draft) Higher Educational Perspective Plan-Frame. According to this statement, the national stock of Higher Educated Manpower may be visualised as broken up in one way into "employment categories", and in another way into "occupational categories". The former break-up is reproduced below:

TABLE 8. EMPLOYMENT CATEGORIES OF NATIONAL STOCK OF HIGHER EDUCATED MANPOWER

Employment Category	Computed Actuals (1960-61)		Control Figures for Interim Target Year		Growth Factor Col. 4 / Col. 2
	No. in Lakhs	(Per cent)	No. in Lakhs	(Per cent)	
1	2	3	4	5	6
Industrial Employment	1·91	(13·4)	11·00	(27·5)	5·8
Service Employment	10·04	(70·1)	22·00	(55·0)	2·2
arm-Home Employment	1·42	(9·9)	4·00	(10·0)	2·8
mployment-Seekers	0·95	(6·6)	3·00	(7·5)	3·2
GRAND TOTAL	14·32	(100·0)	40·00	(100·0)	2·8

74. The first entry in the foregoing table brings out the principal reason why problems of coordination have arisen between the national economy as a whole and the national educational system. During a period of (approximately) 15 years, the relative proportion of the national stock of higher educated manpower which is employed in organised industries (that is to say, in all manufacturing and mining enterprises, electric power supply enterprises, construction projects and public works departments) has to increase from 13.4 per cent to 27.5 per cent. While the total stock increases by about 26 lakhs (from 14 lakhs to 40 lakhs) no less than 9 lakhs (or about one-third of the total increase) has to be diverted to industrial employment. While service employment is multiplied 2.2 times, industrial employment is multiplied 5.8 times.

75. This is a change in the pattern of employment, the like of which has never happened before. It is generally realised that this change necessitates a sharp acceleration and expansion of certain branches of higher education. But it is not yet realised by the authorities concerned that it calls also for important reforms in the structure and content of curricula, methods of enrolment of pupils, and employment of teachers and the organization of educational administration. At the same time, and in close coordination with these reforms, reforms are also necessary in the existing practices of recruitment, practical training and placement in employment of higher educated manpower cohorts. Hence the need for what has been described as "manpower-planned development and reform of higher education", the subject matter of this report.

SECTION II. MAJOR OCCUPATIONAL CATEGORIES

76. Four "major occupational categories" are identified for purposes of detailed planning. These are set out and defined below:

I. *Higher Educated Teaching Manpower*. This group includes all persons holding university degrees (or sub-professional diplomas, if any) who work as teachers in schools, colleges, universities and research institutions, and includes persons who occupy managerial or other positions in educational institutions or educational administration (for which teaching experience is an essential qualification). It excludes, however, holders of teaching posts for which a university degree or sub-professional diploma in engineering/technology or medicine is an essential qualification.

II. *Engineering Manpower*. This group includes all persons, holding university degrees or sub-professional awards such as diplomas in engineering, irrespective of their actual employment. The holders of university degrees may be referred to as Professional Engineers; and the holders of sub-professional awards such as diplomas as Engineering Technicians.

III. *Scientific and Technical Manpower (other than I and II)*. This group includes three sub-groups of higher educated manpower as given below:

(a) *Agricultural/Veterinary Specialists*. This sub-group includes agricultural scientists, agronomists, veterinary doctors, and all persons with higher educational preparation whose services are necessary for scientific practice of agriculture, animal husbandry, forestry and fishery.

(b) *Health/Medical Specialists*. This sub-group includes physicians, surgeons, and all other persons with higher educational preparation whose services are necessary for the scientific practice of medicine, surgery, and the protection of human health.

(c) *Other Scientific and Technical Specialists*. This will include all persons with higher educational preparation who are performing scientific and technical services other than those specified already.

(d) *Public Administrative and Corporate Managerial Manpower (other than I, II and III)*. This group includes (i) the holders of all posts in the departmental establishments of the Government of India or the State Governments which are classified as either All India service posts, or Class I posts or as Class II posts provided that no such post is deemed to be included, of which the holders are classifiable as "Scientific and Technical Manpower" or "Engineering Manpower" or "Higher Educated Teaching Manpower". (ii) The holders of posts in all corporate establishments (other than Government Departments) in the public sector or reporting private sector the functions attached to which are similar to those attached to posts and services referred to in (i) above and for which the same educational qualifications are required.

77. Table 9 below shows the approximate relative size of these four Major Occupational Groups (*vis-a-vis* one another and the total national stock of higher educated manpower). It shows also the pattern of proposed growth.

TABLE 9. MAJOR OCCUPATIONAL GROUPS OF THE NATIONAL STOCK OF HIGHER EDUCATED MANPOWER

Major Occupational Groups	Computed Actuals (1960-61)		Control Figures for Interim Target Year		Growth Factor Col. 4
	No. in Lakhs	(Per cent)	No. in Lakhs	(Per cent)	Col. 2
1	2	3	4	5	6
I. Higher Educated Teaching Manpower . .	2·22	(15·5)	9·00	(22·5)	4·1
II. Engineering Manpower	1·33	(9·3)	7·50	(18·8)	5·6
III. Scientific and Technical Manpower (other than I and II)	1·81	(12·6)	6·50	(16·2)	3·6
IV. Public Administrative and Corporate Managerial Manpower (other than I to III)	2·65	(18·6)	5·00	(12·5)	1·9
TOTAL (I TO IV)	8·02	(56·0)	28·00	(70·0)	3·5
NATIONAL STOCK	14·32	(100·0)	40·00	(100·0)	2·8

78. Before assessing the significance of the foregoing figures, a few observations must be made by way of precaution. The "computed actuals" for the base year (1960-61) are based on data which are both incomplete and defective. They are believed to be good enough estimates for present purposes, *viz.*, to achieve a correct perspective regarding the relative numerical importance of each group as well as the differences between them in the likely rates of future growth.

The figures relating to "engineering manpower" are based on an exhaustive survey which has been already carried out and completed in the IAMR. Similar surveys have been commenced in respect of other categories. They must be similarly carried out and completed in order to provide a firm basis for settling a higher educational perspective plan-frame for operational purposes.

79. It has been explained already (*vide* para 47, Chapter III) that there is need for organising a system of securing "educationally classified employment returns" and for preparing and publishing (on the basis of such returns) a regular series of "Educationally Classified Manpower Tables". The work involved in organising such a system is not unduly difficult. A pilot attempt has already shown the way. It is essential that this attempt should be followed up and developed and improved from year to year. We assume that this will be done; and, meanwhile the figures now put forward will be treated as tentative estimates, to be replaced by firmer estimates as data become available.

80. On this understanding, it may be noted that the four major occupational categories (taken together) accounted for 56 per cent of the national stock of higher educated manpower during 1960-61. The relative proportion is expected to increase to 70 per cent of the national stock during the "Interim Target Year". Public Administrative and Corporate Managerial Manpower was the largest of the four groups in the base year 1960-61 accounting for 18.6 per cent. But its planned rate of growth is the slowest among the four, with the result that this group is expected to become the smallest of the four in the "Interim Target Year" accounting for only 12.5 per cent. Engineering Manpower, on the other hand, will grow three times as fast. Whereas it was the smallest of the four groups in the base year 1960-61, accounting for 9.3 per cent of the national stock in that year, it is expected to grow rapidly and become the second largest (18.8 per cent) in the "Interim Target Year". Higher Educated Teaching Manpower will grow somewhat less rapidly than engineering manpower. It ranked second among the four groups during the base year and it is expected to become the largest group (22.5 per cent) in the Interim Target Year. It is necessary to visualize these important changes, in advance and in the right perspective. Only thus will it become possible to set up the right kind of organisation and adopt the right kind of measures for bringing about the changes. Hence the need for what has been called the Perspective Plan-Frame.

81. "Manpower Planning" is regarded, all too often, as a mere statistical computation, the making of "forecasts" of requirements. Such forecasts, it is supposed, are to be used by educational authorities as the basis for planning expansion of educational facilities. This is an oversimplified and misleading conception of manpower planning as well as educational planning. Such an oversimplification is unavoidable and perhaps even necessary, in the early stages of development of a system of governmental planning of the national economy. But national economic planning has now developed to the point where it is necessary to realise the full implications of both manpower planning and educational planning. It is no doubt necessary that forecasts should be made of what would happen to requirements and what would happen to supply, if existing arrangements about education and employment were allowed to continue unchanged. But that is only the first step. Having arrived at such forecasts, it would be necessary to substitute "control figures" for "forecasts" not only in respect of supply but also in respect of requirements. Such substitution would represent "planning decisions" which give effect to policies.

82. The foregoing observations are relevant to a correct understanding of the figures in Table 9. These figures are not simply "forecasts". They are "control" figures, which are proposed on the basis of assumptions which imply policy decisions as well as specific planning decisions. It should be emphasized that the changes in the relative numerical importance of the four major occupational groups, to which attention is drawn in para 80 above, will not come about automatically. They will come about, as a result of governmental planning decisions taken in advance, embodied in a Perspective

Plan-Frame, and given effect to consistently year after year in successive Five Year Plans.

83. One other observation is relevant at this stage. When manpower planning is undertaken on the basis of policy and embodied in planning decisions they would be equally binding on the agencies which employ manpower (the source of "requirements") as well as the institutions which provide the educational preparation (the source of "supply"). Higher Educated Manpower Planning will call on the one hand for changes to be made in higher educational institutions in almost every aspect of the present system of educational preparation of manpower. It will also call for changes to be made by employers in the present systems of recruiting, training and employing higher educated manpower cohorts. Hence the need for "reform" no less than "development".

SECTION III. HIGHER EDUCATED TEACHING MANPOWER

84. "Higher Educated Teaching Manpower" is at present produced and used without a plan linking production to use. Considering that the national educational system is at the same time, both the producer and the user of this major occupational group, problems of coordination should be comparatively easier to solve in this case than in others. Nevertheless, it is true that the entire national educational system (including all the colleges and the universities) is expanding rapidly on the assumption that the supply and requirements of higher educated teaching manpower will automatically get adjusted to one another in the normal operation of the free market for teaching services. There is not only no plan for ensuring such adjustment, there is neither realisation nor acceptance of the need for such a plan. Is this a defect of the educational system which requires to be remedied? Or is it really the case that the educational system is best served by the classic principles of *laissez faire*?

85. The answers to these questions depend on the weight one attaches to efficiency in the operation of the educational system. It is entirely reasonable to hold the view that a certain amount of inefficiency is a price well worth paying in order to avoid the trouble of planning and in order to preserve existing freedoms. We think, however, that as educational inflation grows, the price is becoming too high; and it is now necessary that planning (which has begun for engineers) should extend to teachers as well. It is true that there is an overall abundance of degree holders, to pick teachers from. But there are serious imbalances between supply and requirements of higher educated teaching manpower. There is an abundance of teachers qualified to teach particular subjects; and shortages of teachers needed for other subjects. There is an abundance of teachers available for employment in large urban centres, and, at the same time, serious difficulties in attracting and retaining teachers in the rural areas. Some districts are better favoured than others. These are quantitative imbalances. There is, above all, a problem arising out of the fact that the teaching career does not attract a fair share of available talent. Employment in all the other three occupational groups is preferred. It is necessary, if these defects are to be removed, that an efficient system of man-power-planning should be organised for higher educated teachers employed in the national educational system. The needed planning will call for reforms, not only in the conditions of employment of teachers but also in existing arrangements for their educational preparation.

86. We assume that this latter view will be accepted by the Government of India and all State Governments. It is assumed that they will all agree that there should be planned programmes of recruitment and placement of higher educated teaching manpower so as to secure first, that a fair share of available talent is attracted to the teaching profession; secondly that rural areas and backward districts are helped to get the teachers they need; and thirdly that educational preparation in different subjects is planned in relation to the number of teachers required in those subjects. These results will not be secured unless suitable agencies are created and entrusted with specific responsibility. The agencies to be set up for this purpose at different levels of education and in different territorial units must form part of the administrative organisation which is responsible for educational development, at the level, and in the territory concerned. As integral parts of the organisation of higher educational administration, each agency must exercise control over educational institutions in the field, allotted to it, so as to secure that the teaching manpower cohorts annually made available by the agency are in fact employed by the institutions under the control of that agency. How can these requirements be reconciled

with the present ways of thinking of educationists generally and university authorities in particular? Obviously there is a new problem here. It is, by no means, an insoluble problem. But the first condition to be fulfilled in order to solve the problem is to convince the educationists in general and university authorities in particular that this is, indeed, a problem and that they have to take an active part in solving it.

87. It is not possible, within the compass of this report, to spell out in detail the different ways in which the solution of these problems may be attempted. It is necessary and sufficient, at this stage, to focus attention prominently on the fact that these administrative implications do exist and they must be accepted, if governments desire to go forward with manpower planning. It is easy enough to secure general acceptance "in principle" of the need for manpower planning. But it is only when the implications of such planning are visualised that it becomes clear that it is not merely a simple process of expansion but is accompanied by changes in existing organisation and methods of work of educational institutions and educational administrative agencies as well as in existing practices of employment of teachers.

SECTION IV. ENGINEERING MANPOWER

88. During the last fifteen years, the Ministry of Education in the Government of India initiated or sponsored numerous educational projects. All of them depended for their success on the cooperation they evoked from the State Governments. Many of these projects were minor ones; two among them can be identified as of major importance. One was the major project of reorganization of secondary schools and colleges which was recommended by the Secondary Education Commission. The other was the project for planned development of engineering education (at the degree level in colleges and the diploma level in polytechnics). The former, it is now generally recognised, has misfired and largely failed to realise the expectations of its sponsors. The latter, on the other hand, has been carried out with outstanding success. It represents an achievement in the educational field which is analogous in its importance and potentiality for future development, to the steel plants in the field of industry and the major irrigation projects in the field of agriculture.

89. What are the reasons behind the differences in the course taken by these two projects? What lessons does this experience offer us in our further efforts? There may be many answers to these questions. We believe the best answer would be that the successful project was "manpower planned", and the other was not. The plan of development of engineering education courses was taken up just at the right time when industrialisation was getting under way and a keen demand was springing up from employers throughout the country for the services of engineering graduates and diploma-holders. The plan was welcomed by the pupils (and their parents) when they found that they were getting increasing access to a branch of education which gave them virtual certainty of a satisfying career. The State Governments were eager to participate in and give effect to the All-India plan, because the beneficial effect of the plan was obvious and unmistakable. These advantages were not present for the other important project. That project was academically sound. But it was not "manpower-planned". It was not "number-controlled". In the absence of these two vital prerequisites, no educational reform is likely to prove successful.

90. The plan of development of engineering education got going effectively during the Second Five-Year Plan period. What may be regarded as the first phase of this process has been concluded during the Third Plan period. The Second Plan period opened (at the beginning of the year 1956-57) with a national stock of 39 thousand degree holders and 51 thousand diploma holders, or 90 thousand in all. By the end of the Second Plan period, the stock had gone up to 58 thousand degree holders and 75 thousand diploma holders, or 133 thousand in all. It is expected that during the current year when the Third Plan period is ending and the Fourth Plan is beginning, the stock would have gone up to 94 thousand degree holders, and 134 thousand diploma holders or 228 thousand in all.

91. *Thus, the increase of stock which has occurred during the five years of the Third Plan period is larger than the entire national stock in existence at the beginning of the Second Plan period.* The significance of growth of this order will not be fully appreciated unless it is borne in mind that the growth which occurred during the Third Plan period was the fruit of the developmental effort made during the Second Plan period. The expansion of capacity on an even larger scale which occurred during the Third Plan period is yet to bear fruit. Indeed the engineering edu-

cational capacity which has been built up, as of today, is sufficient, *without any further increase of capacity,* to assure the further growth of the national stock of engineering manpower up to 447 thousand at the end of the Fourth Plan Period and 702 thousand at the end of the Fifth Plan Period.

92. The programme of accelerated development has achieved its purpose so successfully that the danger has now arisen of its overshooting the mark. What was an acute shortage only a few years ago is getting converted into what might prove to be a visible surplus a few years hence. It is no longer necessary to accelerate the rate of growth. On the other hand it has become necessary to curb the eagerness of State Governments to overexpand. What we now need is not a target but a ceiling of 750 thousand for the year 1975-76.

93. This conclusion is not yet widely accepted. It has, in fact, been vigorously contested in some very influential quarters. The conclusion rests, however, on exhaustive studies of which the results are set out and fully explained in a report issued recently by the IAMR. The operative recommendations contained in that report are reproduced below:

"The (Draft) Perspective Schedule gives effect to the main conclusion of this report regarding the nature of expansion required. First, there has to be a short pause of two years for engineering colleges and three years for polytechnics. Then the pause has to be followed by steady expansion of intake capacity, at slower rate than hitherto. From the mid-year of the Fourth Five-Year Plan, it is proposed that the intake capacity of all engineering colleges in the country should be increased every year by 1500 seats; and the intake capacity of all polytechnics should be increased by 3000 seats. These proposals will disappoint the expectations of State Governments. It is hoped that the Government of India will find the analysis presented in this report to be sufficiently persuasive and helpful in carrying conviction to State Governments. (It may be mentioned here that the proposed limitation on the rate of growth of aggregate intake capacity does not preclude any redistribution of such intake capacity, where this is found desirable either on a territorial basis or on a speciality-wise basis).

"The short pause proposed is intended, among other things, to enable the Government of India and the State Governments to take all preparatory measures needed for implementing the reforms proposed in various papers of the Institute including the First Report and the present report on Engineering Manpower Survey.

"To begin with, the present condition of polytechnics must be looked into and measures taken to staff and equip them adequately and to adopt all other measures necessary for controlling and reducing wastage rates.

"A progressive and orderly change-over from the present "standards" pattern to the poroposed "cooperative" pattern of engineering education at degree level (as recommended in the First Report) is to be planned and carried out. Similar reform has to be planned and carried out in respect of polytechnic education at diploma level also.

"Attention should be devoted to the problem of the 'practicals'. Schemes designed to provide them engineering education of the 'extension' pattern should be formulated and implemented on a pilot basis to start with. Experience should be quickly gained in operating such schemes. This is especially necessary in respect of 'extension' education at the diploma level for 'Matric Craftsmen". Provision of such facilities for extension education should be regarded as the first charge on the developing intake capacity of polytechnics.

"It will be impossible to make such a beginning with these measures unless the agencies which employ engineering manpower take parallel action and important reforms are carried out in their policies and practices regarding recruitment, pre-employment training, promotion and provision of facilities for in-service development including institutional education of the 'extension' pattern. The nature of the needed reforms has been described at length in various papers, and may be summed up in two concepts. One is the concept of "Planned Encadrement" of engineering manpower; the other is the concept of "Engineering Manpower Training Pools". It is recommended that schemes embodying these reforms should be planned and implemented before the expiry of the Fourth Five-Year Plan period".

94. It is not proposed, in this report, to discuss the merits of the various proposals for reform of the present system of engineering education which have been put forward in other reports. It is sufficient merely to urge that it should be recognised by the responsible authorities that they have now reached the end of one phase and must begin the next phase of the developmental process on which they started during the

Second Plan Period. The emphasis must shift decisively from expansion of numbers (which was the urgent need during the first phase) to improvement of quality and utility (which is the prime need of the second phase). It must be recognised that the second phase entails the planning and implementation of measures of reform which is always a much more difficult process than simple expansion of numbers on the basis of a traditionally established pattern of organization. There is need for reviewing the organization of engineering educational administration which has grown up on an *ad hoc* basis during the first phase. It must be reorganised and strengthened so that it may now be 'reform oriented'.

SECTION V. SCIENTIFIC AND TECHNICAL MANPOWER (OTHER THAN ENGINEERING AND SCIENCE-TEACHING MANPOWER)

95. This group, as explained already, includes two distinctive sub-groups based on applied biological sciences and one other sub-group based on a variety of applied physical sciences (other than engineering). There are many problems relating to the development and reform of existing arrangements for the educational preparation of cohorts of this group, as well as utilisation of their services. It is not proposed in this report to discuss these problems partly because they have not yet been studied in detail from the manpower point of view.

96. A few observations of a general nature may, however, be made. The first relates to the question of administrative organisation of planning and development. The organisation which has grown up during the last decade for purposes of development of engineering education offers a working model which may be usefully adopted for other types of specialised higher education. The characteristic features of this organisation are the following:

(i) An All-India plan envisaging targets of growth of the national stock, and targets of increase of higher educational capacity derived therefrom.

(ii) An effective system agreed upon between the Government of India and State Governments for reaching decisions regarding the distribution of new capacity among the different states.

(iii) A similarly effective and agreed system for assuring the availability of funds for meeting both recurring and non-recurring expenditure on a continuing basis.

(iv) (a) An All-India Council of Specialised Higher Education, attached to an appropriate Ministry of the Government of India with coordinating committees; and an organised permanent staff. (b) A Board of Specialised Higher Education in each State, attached to an appropriate department of State Government, with an organised permanent staff.

It is suggested that both in the agricultural-veterinary field, and the health-medical field, it will be necessary to set up suitable organisation employing the foregoing characteristic features.

97. It will be noted that Agricultural and Veterinary specialists are included as one of the three important sub-groups of "scientific and technical manpower other than engineering manpower." This sub-group should be distinguished from the employment category earlier referred to as "Farm-Home-Manpower". The specialists referred to in this section are those required for "service employment" in agricultural and educational institutions, in agricultural extension organisations, in agricultural co-operative organisations, and so forth. Though these specialists are functionally distinguishable from higher educated manpower engaged in practical farming, arrangements for educational preparation of both types of manpower must be planned together.

The concept of the diploma, a sub-professional award, which has been put forward in this report as an integral part of higher education becomes highly significant in this context. There is need for organising and developing "sub-professional courses" leading to diploma in the agricultural-veterinary field which will provide the "sub-professional specialists" needed in Farm-Service Employment, as well as higher educated farmers.

SECTION VI. PUBLIC ADMINISTRATIVE AND CORPORATE MANAGERIAL MANPOWER

98. Manpower-planning is commonly supposed to be something to do with "specialists", and these are sharply distinguished from others who are referred to by the queer name of "generalists". The latter includes every one engaged on duties which can be described as "administration" or "management". They are left out of planning calculations, which are usually limited, at the higher educational level to engineers,

doctors, scientists and teachers. The underlying idea, presumably, is that any one can be an administrator or manager; that he needs no particular qualification (much less any professional educational preparation) in order to perform his functions efficiently.

99. Whether or not such a view is explicitly declared, it is indubitable that the educational system includes no systematically planned arrangements for producing managerial-administrative manpower, such as there are for the educational preparation of engineers, doctors and school teachers. In recent years, the B.Com. degrees have been on the increase; and they are meeting a real need even though they provide only sub-professional manpower and there is also a good deal of criticism about their adequacy even for the sub-professional level. There are also some academic courses, mainly at postgraduate level, which purport to deal with public administration and business management at the professional level. They have hardly begun to make any very significant contribution, and their utility for purposes of development of professional manpower cannot be regarded as generally accepted.

100. Does this really matter? It is likely that many people (including most public administrators and corporate managers themselves) would answer this question without hesitation in the negative. Administration and management, they would say, are not "subjects" to be taught by academic people. They are "arts" to be practised. The more extreme exponents of this view would claim that "managers are born, not made". Others who concede that the arts can be learnt would still insist that they can be learnt only on the job and only from practising administrators and managers. The educational system is necessary, in this view only for two purposes. First, it is needed in order to produce the cultivated mind and formed character which is very desirable (if not altogether indispensable) for any one who is selected to practise the arts of management and administration. But it does not much matter what subjects were included in his university degree; for he is not going to use his special knowledge of any of them. The educational system is necessary and relevant for another purpose also. It is a convenience to the agencies which recruit managerial-administrative manpower in as much as it identifies the talented few from among whom the selection can be made. If this convenience were not there, the recruiting agencies will have to search haystacks for needles. As a result, the relative proportion of wrong choices will be high, with consequent impairment of efficiency.

101. If this widely held view is correct, there will be no need to include this group of manpower in the organization of manpower-planned development or reform of higher education. But, is this view correct?

We believe that it was substantially correct until about twenty years ago. Since then however, conditions have changed so much and so rapidly that the widely held view has ceased to be valid in the new conditions. There are five different sets of considerations which converge to the conclusion that the time has arrived when educational preparation of managerial-administrative manpower must be recognised to be a distinctive function for which organised educational preparation has to be provided in the educational system.

102. It should be mentioned, at this stage, in order to remove an otherwise inevitable misunderstanding, that it is not intended or suggested that engineers, doctors, scientists and teachers are not to be employed in a managerial administrative capacity. Obviously, there is a whole range of managerial administrative posts which are to be held by them. By definition we deal only with those posts in Government Departments and Corporations which are to be filled by persons other than engineers, doctors, scientists and teachers. What are the five considerations which, in our view, require that these "other persons" should also be provided with specialised educational preparation? We shall refer to this new type of specialised education as "managerial arts education".

103. We may begin with the problem of "needles in the haystack" for which, it is conceded, that the educational system has a function to perform. In the context of growing inflation of the educational system, the number of first degree holders turned out by our universities has grown so large that they have become "haystacks" themselves. The B.A. degree, in particular (of which the numbers are still the largest) has virtually lost significance as a distinguishing mark of educational attainment. There is need, therefore, for at least some degree of particularisation within the educational system of the awards which are to be recognised as defining the field of

choice. Some change in the present system is clearly called for on this account.

104. The second among the considerations we have in mind arises out of this same context of educational inflation. There is a widespread view (especially in academic circles) that the problem of educational inflation has arisen precisely because of this use of the educational system, as a convenience provided for the benefit of the administrative authorities. A few years ago, the Ministry of Education took the view that this entanglement should be removed by effecting drastic changes in the rules of recruitment to the public services. A higher-power committee was appointed. The majority of this committee found the problem to be somewhat more complicated than was believed by a minority which took the view that higher educational awards were wholly unnecessary for purposes of recruitment to any of the administrative services of the country. Eventually, no significant changes were made. This was not surprising, because the devaluation of educational awards arising out of educational inflation renders it necessary that the employing authorities should not only maintain but actually raise their specifications of educational qualifications for employment. Otherwise, the efficiency of the machinery of administration, already under great strain for other reasons, would be further impaired. It was, in our view, entirely unreasonable to demand that all Government Departments and Corporations should create more difficulties for themselves in order to help the educational authorities avoid the troublesome tasks involved in controlling the numbers to be admitted to higher educational institutions. It was the exact opposite of a manpower-planned approach to the problems of development and reform of higher education.

105. For any one who is serious about the quality and utility of higher education, there is no escape from the necessity for instituting direct control over the growth of numbers enrolled in higher education. But if this necessity is accepted and a policy of direct control of numbers is formulated, the implementation of such a policy can be made very much easier than it would otherwise be, if the numbers required for recruitment by Government Departments and Corporations can be fixed and provided for by special courses in much the same way as the numbers required for engineering and medicine are at present provided for. If this can be done, the requirements of the employers can be met with a substantially better qualified supply than they are at present securing. At the same time, the pressure on the "general education" degree courses will be relieved. The pupils who have no interest in degrees (apart from their use for securing managerial-administrative employment) will have been selected and siphoned off to the new course, just as they are at present siphoned off to the engineering and medical degree courses. Those who have tried and failed to secure admission to the new courses will drop out of the race. Here, then, is the second of the three considerations which lead to the conclusion that it is necessary to devise a first degree course (similar to the engineering and medical degree courses) which may be recognised as the source of recruitment for managerial-administrative employment. We shall refer to such a first degree as the "Bachelor Degree in Managerial Arts" or B.M.A. degree. We take the view that the institution of a new B.M.A. degree is necessary, in order to bring educational inflation under control.

106. It must be observed at this stage that the process of planned selection for engineering and medical degree courses mentioned above is beginning to have an adverse effect on the availability of high calibre talent suitable for recruitment to managerial-administrative employment. This does not, necessarily, mean that such employment has ceased to be coveted. The new development is that there is virtual certainty of a satisfying career for persons selected for engineering and medical degree courses for the reason that these courses are "manpower-planned". For those who are not so selected, the future is a gamble. Naturally, this consideration weights the choice and results in a distorted pattern of distribution of talent. There is need for removing this distortion by ensuring that the allocation of talent to the higher academic as well as all other professional fields is effected at one and the same stage of the educational process. This, then, is the third among the considerations which have led us to the conclusion that a new B.M.A. degree is necessary. It is the means by which talented pupils who are identified as suitable for higher academic and professional fields may be distributed among those fields with the maximum usefulness to the nation and the maximum satisfaction to the individual pupils themselves.

107. The three foregoing considerations would be valid even if the traditional view is still true that, for purposes of administration and management, it does not matter much what kind of university education is provided, so long as it is good quality education. But the process of planned development has brought our country to a stage where this is no longer true. It has become highly desirable, if at all possible, that every new recruit to the ranks of managerial-administrative manpower should achieve a common understanding of the complex organization of the democratic nation-state, and its increasingly planned national economy whose affairs he will be managing. Whatever may be the particular business of the particular government department or corporation he may be serving, he will find that the business transacted in all of them has become interconnected because of our new system of planning. A basic stock of knowledge of the Constitution and laws of our country, of the working of our national economy, as well as our political, administrative and cultural institutions, and finally of the objectives and methods of our new system of organising development through Five Year Plans, has now become a required minimum qualification for the entire national stock of managerial-administrative manpower. The institution of a new B.M.A. degree will make it possible to equip every new entrant to the ranks of managerial-administrative manpower with this basic stock of necessary knowledge with maximum efficiency. This is our fourth consideration.

108. It brings us to the last among all the reasons in favour of the reform proposed. The establishment of this concept of a national stock of managerial-administrative manpower with the functions thus specified and a nationally uniform system of educational preparation for the performance of these functions will make a far-reaching contribution to the processes of national integration. All public administrators and all corporate managers, no matter where they are working and on what particular activity they may be engaged, will come to regard themselves as members of different cadres of one and the same public service.

109. In the light of the foregoing explanation, it is hoped that the Government of India and the State Governments will feel persuaded that it is necessary to plan and implement a new programme of reform of higher education, in order to provide planned educational preparation for the supply of managerial-administrative manpower cohorts needed by Government Departments and Corporations. The Bachelor Degree in Managerial Arts (or B.M.A.) is suggested as a convenient name by which the new programme may be understood and popularised. Obviously, special machinery will be needed for the purpose. The machinery evolved during the last decade for manpower-planned development of engineering education offers a good working model. We shall revert to this suggestion in the final chapter of this report.

CHAPTER V. PROPOSED GROWTH OF THE ANNUAL OUT-TURN OF HIGHER EDUCATIONAL COHORTS AND THE DIFFERENT LEVELS AND TYPES THEREOF

SECTION I. PRELIMINARY REMARKS

110. Let us briefly recall the conclusions we have reached so far about the national stock of higher educated manpower:

First. This stock is growing rapidly from year to year. In terms of overall numbers, further growth needs no stimulation. On the other hand, it needs curbing. From just over 14 lakhs in the base year 1960-61, we should plan for its growth up to 40 lakhs in the interim target year (which is, at the earliest, 1975-76). This figure of 40 lakhs is not a "target"; it is a "ceiling". The most important criterion for regulating the further growth is the need for ensuring that the number of "higher educated employment-seekers" is prevented from becoming unduly large.

Secondly. We have an existing pattern of use of this national stock of higher educated manpower. This pattern of use is reflected in the distribution of the stock in different employment categories and different occupational groups. This pattern is changing as a result of planned development of the national economy. We must visualise the changes which will occur in future years and plan these changes so as to meet efficiently the manpower requirements of the growing economy including the growing educational system. This entails the setting of "targets", as well as "ceiling" (both of which we refer to as "control figures") for the interim target year, in respect of the principal employment categories and the major occupational groups. These targets and ceilings have to be set within the planned ceiling for the national stock as a whole.

Thirdly. The foregoing targets and ceilings will need specific measures for stimulating the rates of growth at some levels and in some types of higher education, as well as the need for curbing the rates of growth at other levels and in other types. For the same reason there will be need for specific measures for stimulating the rate of growth of institutions located in some parts of the country and curbing the rate of growth of institutions located in some other parts of the country.

Fourthly. There wll be need not only for planning the growth of higher education on the pattern as at present organised, there will be need also for bringing about important reforms in that organization so as to secure that the matching of supply and requirements is effected in respect of the different levels and different types of the major occupational groups with the maximum practicable efficiency. Hence, the need not only for "manpower-planned development" but also for "manpower-planned reform" of higher education.

111. Stimulating the rates of growth of education (at any level and of any type and in any area) is a highly popular undertaking. The governments concerned can be expected to do it with eagerness, the availability of necessary funds being the only limiting factor. It is a very different matter when it comes to the institution of controls on growth. How to organise controls which are necessary but unpopular is a problem which still awaits a solution. Again, the idea that organisational structures should be reformed is generally acceptable. It is only when the idea gets crystallized to the point of formulating a specific scheme of reform affecting particular institutions, that resistances emerge which usually suffice to render the scheme still-born. These are inescapable practical limitations which governments encounter in every field including education. There is not much use in proposing measures of control and reform which will prove to be too difficult for governments to put through. At the same time, it must be recognised that unless difficulties are faced in time and overcome to the extent practicable, the problem gets worse and worse.

112. It is because of these considerations that the need arises for the "control figures" which are set out in the statement which forms Part II of the Higher Educational Perspective Plan-Frame. It is the purpose of this chapter to explain the meaning, purpose, and implications of these figures so as

to enable a judgement to be made about whether the degree of control envisaged by these figures is practicable. If the figures proposed call for measures which are deemed to be too difficult, they may be resettled so as to reduce the difficulties. But a framework of control figures is needed in order to enable the implications of policy decisions to be clearly understood and accepted before these decisions are made. It will be noted from the statement under discussion that "computed actuals" are furnished for the years 1956-57 and 1961-62 and the "control figures" are furnished for the interim target year. A recent five-year period was chosen in order to bring out the recent rate of growth and to enable it to be compared with the proposed rate of growth. 1961-62 was the first year of the Third Plan period. It happened to be the latest year for which official data supplied by the Ministry of Education were available when the present studies were started. Hence the choice of the five-year period ending with 1961-62, as the base period, even though 1960-61 is the base-year for other purposes.

SECTION II. HIGHER EDUCATIONAL COHORTS AND HIGHER EDUCATED MANPOWER COHORTS

113. Higher Educational Cohorts of any year include (as already explained) all persons who receive any university degree or any sub-professional diploma in that year. This number (it is computed) was 127,700 in the year 1956-57, and it increased to 210,500 in the year 1961-62. During this five-year period the annual out-turn increased by 82,800. The average annual increase was 16,560.

114. The proposal is that the control figure for the interim target year (which we shall assume provisionally to be fixed for 1975-76) should be 400,000. During the fourteen-year interval between 1961-62 and 1975-76, the increase should be limited to 189,500. The average annual increase will be 13,536. This may be compared with the average annual increase of 16,560 already attained before 1961-62. The average annual increase has, no doubt, risen still higher during the Third Plan period. It is obvious that this will imply a substantial slowing down of the rate of growth during the Fourth and Fifth Plan periods. This slowing down will have to be brought about through suspension of further expansion in some parts of the country and reduction of the rate of expansion which would have been otherwise undertaken in some other parts of the country. At the same time, expansion will have to be stimulated in those parts of the country which are lagging too far behind the national average.

115. A certain number of higher educational cohorts who have completed Regional Higher Education will be re-enrolled in National Higher Education every year. These are the pupils admitted to post-graduate courses (M.A., M.Sc. etc.) as well as professional degree courses to which admission is limited to pupils who have already taken their first degrees. It should be recalled that the National Higher Educational degree courses include what may be called the "pedagogical" courses, which are known by different names (B.T., B.Ed. etc.). They account for a large proportion of re-enrolment. Such re-enrolment of persons with regional higher education, re-enrolled in national higher education, accounted for 35,000 cohorts (out of 127,700) in the year 1956-57; and 60,000 cohorts (out of 210,500) in the year 1961-62. It is proposed as the control figure for 1975-76, that the number of cohorts re-enrolled in higher education should be held down to 75,000 (out of 400,000).

116. The proposed control figure for re-enrolment has probably been reached already. The proposal to limit the number might thus seem to call for a complete standstill in National Higher Education. That is not, however, the case. For the proposal is tied up with another proposed decision of educational reform policy. This policy envisages the development (side by side with the ordinary B.A./B.Sc. degree courses of regional higher education) of academic honours degree courses, as well as professional first degree courses of National Higher Education. This is necessary (as explained in the last chapter) for two purposes. One is to secure that a fair share of talented pupils is attracted to courses which lead to different professional careers and to correct the distorted distribution which is taking place at present for the reason that "manpower-planned development" applies only to engineering and medical degree courses and not to others. At the same time, it will be one of the measures needed for securing another important purpose. That is to diminish the pressure for admission to the B.A./B.Sc. degree courses and thus help to control educational inflation. It is only when this reform is carried through that we shall be able to claim that our first degrees of national higher education are of the same standard as the first degrees awarded by universities in all educationally developed countries of the world.

117. The effect of the proposed restriction of the rate of growth on the scope for expansion of national higher education is explained below:

The total number of higher educational cohorts who received National Higher Educational awards (including pedagogical degrees) was 48,700 in 1956-57. The number increased to 81,400 in 1961-62. The increase was 32,700 during five years; the average annual increase was 6,540.

The control figure proposed for 1975-76 is 150,000. This permits an increase of 68,600 during 14 years; or an average annual increase of 4,900. It will thus be seen that the proposed clamp-down on re-enrolment does not entail a stand-still of National Higher Education. There is adequate scope for expansion, even though such expansion would be strictly controlled.

118. The net contribution which the educational system makes to the growth of higher educated manpower is measured by the number of higher educated manpower cohorts; that is to say, the number of higher educational cohorts, net of re-enrolment in higher education. This number was 92,700 in 1956-57; and it rose to 150,500 in 1961-62. The increase over five years was 57,800. The average annual increase was 11,560. The control figure proposed for 1975-76 is 325,000. This will permit an increase of 174,500 over a fourteen-year period. The average annual increase would be 12,464. This comparison between 12,464 and 11,560 is worth noting. Even though the annual out-turn of higher educational cohorts at the national level is proposed to be increased more slowly between 1961-62 and 1975-76 (13,536) than between 1956-57 and 1961-62 (16,560), the annual out-turn of higher educated manpower cohorts at the national level is planned to grow faster. This will prove to be possible, because of the proposed reform which will increase the relative proportion of academic honours degree courses and professional first degree courses in national higher education.

The superior efficiency of academic honours degree courses as compared with the present M.A./M.Sc. degree courses can thus be established on several grounds.

SECTION III. DIFFERENT TYPES OF NATIONAL HIGHER EDUCATIONAL COHORTS

119. As explained in an earlier chapter, what we call higher education includes much that is not recognised as higher education in educationally developed countries. That part, which is clearly sub-standard in this sense is now identified as Regional Higher Education. National Higher Education is what is already up to standard or can be readily levelled up. The annual out-turn of National Higher Education is computed to have increased from 48,700 in 1956-57 to 81,400 in 1961-62. The average annual increase during this five-year period was 6,540. Table 10 shows how the foregoing increase was distributed among different types of national higher educational cohorts.

TABLE 10. OBSERVED GROWTH OF NATIONAL HIGHER EDUCATIONAL COHORTS (1956-57 To 1961-62)

Type of National Higher Educational Cohorts		Number of Cohorts		Average Annual Increase 1956-57/1961-62
		1956-57	1961-62	
I. Academic Pedagogical Educational Cohorts	Science	7,400 (15.2)	12,100 (14.9)	940 (14.4)
	Arts	23,600 (48.5)	41,600 (51.1)	3,600 (55.0)
	TOTAL (I) . .	31,000 (63.7)	53,700 (66.0)	4,540 (69.4)
II. Professional Specialised Educational Cohorts	Engineering	4,800 (9.8)	9,500 (11.7)	940 (14.4)
	Agricultural Veterinary, Health. Medical etc.,	8,500 (11.3)	8,500 (10.4)	6,00 (9.2)
	Commercial, Legal, Administrative etc.	7,400 (15.2)	9,700 (11.9)	460 (7.0)
	TOTAL (II) . . .	17,700 (36.3)	27,700 (34.0)	2,000 (30.0)
	GRAND TOTAL[1] (I and II)	48,700 (100.0)	81,400 (100.0)	6,540 (100.0)

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[1] Figures within brackets represent percentages to the respective column totals.

120. The figures in Table 10 are highly instructive and call for the following comments:

(a) Nearly two-thirds of the cohort outturn of 1956-57 were "academic-pedagogical". "Professional-Specialised" cohorts numbered little more than one-third. This was bad enough because even the "pedagogical" element, like the rest of the "academic" education, was being provided in an aimless manner. But the trend of growth between 1956-57 and 1961-62 was making a bad situation worse. Out of the increase of capacity which was occurring during the five-year period, as much as 69·4 per cent was appropriated by the "academic pedagogical" type courses, with the result that the relative proportion of outturn of this type actually increased from 63·7 per cent to 66·0 per cent.

(b) Within the "Academic-Pedagogical" type, science courses accounted for 15·2 per cent and arts courses for 48·5 per cent in 1956-57. This again was bad enough. But the trend was worse. The Arts courses were appropriating more than their own excessive share of new capacity, with the result that the relative proportion of academic pedagogical science courses failed to increase (there was a slight drop from 15·2 per cent to 14·9 per cent) while the relative proportion of academic-pedagogical arts courses increased from 48·5 per cent to 51·1 per cent.

(c) Within the professional-specialised type, engineering courses alone improved their share from 9·8 per cent to 11·7 per cent, while all other sciences—based specialised courses dropped from 11·3 per cent to 10·4 per cent. The specialised arts courses (which prepared pupils for commerce, law, administration and other specific careers) dropped even more from 15·2 per cent to 11·9 per cent.

121. We have already seen that there is an educational inflation which is causing uncontrolled expansion to take place, so as to create increasing unemployment and under-employment. We now see that the trend of growth of the different types of higher education was such as to reinforce this tendency. Specialised educational courses which offer a prospect of utility and employability were losing ground. Science courses were failing to gain ground but there was excess growth in arts courses which provided no specific preparation for any career except as teachers of arts subjects. Naturally when an abundant supply of higher educated manpower cohorts who are prepared for no other employment except teaching arts subjects is made available, the institutions find it easier to expand in arts than in science. We recognise here the characteristic features of an inflationary spiral. *There is no arrangement in the present system of educational administration whereby any authority can ensure that the educational institutions are prevented from taking this easy but useless course and assisted to take the more difficult but also more useful and necessary course.*

Each institution decides for itself how it wants to expand; and it clears its proposed decision with the university. The university applies only academic criteria and authorises expansion if teachers and physical facilities are available. Neither the university, nor any government department possesses either the power or the responsibility of applying any other criteria designed to secure control of numbers.

122. It is not sufficient to say about this situation, that there is no planning. It is necessary to go further and observe that, even if planning had been there, it would have served no purpose because there was no authority exercising that measure of control over the system which is necessary for giving effect to any plan. The institution of any control of this kind will obviously run counter to all current habits of thinking. What will happen to the 'autonomy' of universities? The answer to this question must be a counter-question: 'Autonomy in what and for what purposes?' The courts of this country administer the law; they do not make it; that is done by legislatures. The Public Service Commissions of this country do not create posts; that is done by governments; but the commissions make the selections for appointments to these posts. The courts are autonomous; so are the Public Service Commissions. The universities cannot be more autonomous than the courts or the Public Service Commissions. They are institutions created by law, and supported by public funds in order that they may serve the public purpose of organising the educational preparation of higher educated manpower. If the legislatures

concerned should now deem it fit to impose new duties and responsibilities on universities in furtherance of a plan of development and reform of the educational system accepted by them, then the universities should, obviously, be ready to perform the new duties and discharge the new responsibilities to the satisfaction of the legislatures.

This, it must be observed, is one of the necessary implications of acceptance of the policy proposed in this report. Let us assume that this implication will be accepted.

123. We proceed to examine to what extent the control figures proposed for the Interim Target Year (assumed to be 1975-76) will help to correct the faulty trend of growth which took place between 1956-57 and 1961-62. This may be seen from the figures in Table 11.

124. We may repeat the warning given at earlier stages that the figures we have given are not intended to be and should not be regarded as sacrosanct. They are the results of a necessarily incomplete study of unavoidably incomplete data. The figures can and should be reviewed and revised in the light of fuller study of more complete data. Meanwhile, they are as good as any that can be had and they suffice for the purpose in view: which is to carry conviction to the responsible authorities about the need for perspective planning of a different kind from the one with which we are familiar and to indicate the implications of such planning for policy and administration. With this explanation, the figures in Table 11 may be studied and compared with those of Table 10. They suggest important conclusions which will be now presented.

125. The average annual increase of overall out-turn during the perspective planning period (1961-62 to 1975-76) will be only 4,900. as compared with 6,540 during the base period (1956-57 to 1961-62). In general, therefore, increase in the number of seats will have to be permitted much more sparingly in future than hitherto.

126. This control will have to operate strictly on academic pedagogical education. Compared to 4,540 in the base period, the average annual increase during the perspective planning period can only be 1,879.

TABLE 11.(PROPOSED) GROWTH OF NATIONAL HIGHER EDUCATIONAL COHORTS (1961-62 to 1975-76)

Type of National Higher Educational Cohorts		Number of Cohorts		Average Annual Increase 1961-62/ 1975-76
		Computed Actuals 1961-62	Control Figures 1975-76	
1		2	3	4
I. Academic-Pedagogical Educational Cohorts	Science	12,100 (14·9)	30,000 (20·0)	1,279 (26·1)
	Arts	41,600 (51·1)	50,000 (33·3)	600 (12·2)
	TOTAL (I)	53,700 (66·0)	80,000 (53·3)	1,879 (38·3)
II Professional Specialised Educational Cohorts	Engineering	9,500 (11·7)	30,000 (20·0)	1,464 (29·9)
	Agricultural, Veterinary, Health, Medical, etc.	8500 (10·4)	20,000 (13·4)	821 (16·8)
	Commercial, Legal, Administrative etc.	9,700 (11·9)	20,000 (13·3	736 (15·0)
	TOTAL (II)	27,700 (34·0)	70,000 (46·7)	3,021 (61·7)
GRAND TOTAL* (I and II)		81,400 (100·0)	150,000 (100·0)	4,900 (100·0)

*Figures within brackets represent percentages to the perspective column totals.

Within this type, science courses will fare better with an average annual increase of 1,279 in the perspective planning period as against 940 in the base period. On the other hand, control must be very strict indeed in respect of academic-pedagogical arts courses. The scope for increase is very limited. As against an average annual increase of 3,600 during the base period, this has to be only 600 for the perspective planning period. It is likely that this scope has already been exhausted by uncontrolled increases during the Third Plan period.

The figures suggest that there will be need for a stoppage of expansion during the Perspective Planning Period of the M.A. degree course in many parts of the country accompanied by a cut-back and diversion to professional-specialised arts courses in many other parts.

127. The position is of course different in respect of professional-specialised education. As against an average annual increase of 2,000 during the base period, we can have 3,021 during the Perspective Planning Period. The scope exists in each of the three different types of professional specialised education.

So far as engineering education is concerned, the organization needed for planned development has already been built up efficiently and there is no doubt whatever that the increase of out-turn indicated by the proposed control figure will be attained. The problem (as already explained) is how to curb the local pressures which are forcing State Governments to over-expand the system; and how to persuade the engineering educational authorities to recognise the need for and to concentrate on reforms designed to bring about better adaptation of educational preparation to the changing pattern of employment. The problems of engineering education are the problems of the second phase of development. The first phase is yet to begin in respect of other types of education. No proper system for organization of planned development has come into existence (except, to a limited extent for medical education). There is a great deal to be done (and done quickly) if the proposed control figures (which are targets and not ceilings) are to be made effective in respect of planned educational preparation of agricultural and veterinary specialists, health specialists, school teachers, college teachers, corporate managers and public administrators.

SECTION IV. PROFESSIONAL-SPECIALISED EDUCATION AND SUB-PROFESSIONAL-SPECIALISED EDUCATION.

128. We have used the expression "Professional-specialised" education, in order to distinguish certain courses of education from others which are referred to as "Academic-pedagogical". This terminology is appropriate at the level of national higher education. The pupils who have successfully completed professional-specialised education, may be properly described as "professional" manpower if they succeed in securing the type of employment for which they have been prepared. There are parallel courses at the level of Regional Higher Education which may be described as "sub-professional-specialised". For purposes of organising manpower-planned development of higher education, it becomes necessary to determine an optimum proportion in the out-turn at the two levels.

129. So far as engineering education is concerned, it will be observed that the out-turn of degree holders and sub-professional diploma holders were respectively 4,800 and 5,000 during 1956-57, the ratio was very nearly one to one. During 1961-62, the out-turn was 9,500 and 10,400. The ratio was improving in favour of sub-professional diploma holders, but only slowly. According to the proposed control figures, the out-turn during 1975-76 will be 30,000 degree holders to 50,000 sub-professional diploma holders. There will be a distinct improvement in favour of diploma holders, but the ratio would still be only 3:5.

130. Is this the right ratio to plan? There are a great many people who will answer the question unhesitatingly in the negative. The subject has been studied in depth in relation to the mechanical engineering and electrical engineering specialities. The results of the study are set out in the second report of the engineering manpower survey issued by the IAMR. The following conclusions emerge from the survey.

First. The widespread view about the optimum ratio is based on conditions prevailing in countries where industries developed slowly over a long period and where the general educational level of skilled workers is high. Conditions in our country are the exact opposite. They are more nearly comparable with those prevailing in the USSR during its second plan period. This comparison shows that our ratios are appropriate to our conditions.

Secondly. It is, in any case, quite unprofitable to debate this issue, because the composition of the supply is now predetermined for several years in advance. There are several practical limitations on the possibility of making quick changes in this composition.

Thirdly. It follows that employers must be prepared to employ engineering graduates and diploma holders in the proportion indicated by the control figures. At the same time educationists must be prepared to make changes in existing curricula and make other adaptations of their existing educational practices so that the pupils are better prepared than they are for the types of employment on which they are likely to enter. This is the reason why reforms are urgently needed. Experience shows that engineering educationists (by and large) are insufficiently responsive to this new requirement. This defect cannot be removed unless changes are effected in the management of educational institutions and organization of engineering educational administration. The tasks of the second phase need men who are employment-oriented and reform-minded.

131. In respect of specialised scientific education (other than engineering education) the ratio of professional-specialised education to sub-professional specialised education was 5:2 in 1956-57 and 17:10 in 1961-62. The proposed control figures would improve the ratio in favour of sub-professional-specialised education up to 1:1. Here again, it is not a question of what is an ideal ratio, but how fast (in practice) the ratio can be improved. Similar considerations apply to commercial, legal, administrative and other specialised arts education.

132. Once again we are led to comment on the striking progress made during the first phase of development of engineering education and how it serves as a model for other branches of education. There is urgent need for devising sub-professional courses leading to diplomas in the other fields and developing them institutionally with the same speed and energy which has been displayed during the last ten years in the development of polytechnics. This conclusion will also help to explain the importance we attach to the inclusion of sub-professional courses in our definition of higher education.

CHAPTER VI. PROPOSED GROWTH OF PUPIL ENROLMENT AND TEACHER-EMPLOYMENT IN HIGHER EDUCATIONAL INSTITUTIONS AND FINANCIAL PROVISION FOR DIRECT EXPENDITURE THEREON

Section I. Preliminary Remarks

133. For planning the development of higher education, we start with the national stock of higher educated manpower. We plan the growth of this manpower stock with targets determined by effective demand and ceilings determined by effective usability. From these targets and ceilings for planned growth of manpower stock, we deduce targets and ceilings for planned growth of higher educated manpower cohorts. From these again we deduce targets and ceilings for planned growth of higher educational cohorts. The last step constitutes the link which binds together higher educated manpower planning and higher educational planning. It is the strength of this link, which determines whether the educational development process is efficiently educational system.

> [*Note*: The foregoing concept of interrelated but separate planning processes requires to be emphasised. This is necessary because it is nowhere clearly formulated at present. Educational planning and manpower planning are two different things. One is not part of the other. They intersect. Manpower planning is one aspect (just as financial planning, and material-supply planning are two other aspects) of the entire process of planned development of the national economy including the national educational system.]

134. It is relatively easy to compute the relationship between the numbers of pupils required to be enrolled in order to assure the supply, in planned numbers, of educational cohorts. We must thus plan the growth of enrolment of pupils. A growth plan for employment of teachers can be deduced from the growth plan for enrolment of pupils. Finally a growth plan for allocation of funds can be deduced from the foregoing growth plan. This is the basis on which Part III of the Higher Educational Perspective Plan-Frame has been constructed. The calculations are briefly explained in the sections which follow, together with their implications for policy and administration.

Section II. Enrolment of Pupils

135. As we are operating on a scheme of standardised classification of curricula and awards which differs from the conventional classification adopted for compilation of official statistics, it has become necessary to undertake special computations for determining the actuals of 1956-57 and 1961-62 (the years which define our base period). This fact should be borne in mind while studying the relevant figures.

136. Against an aggregate out-turn of 48,700 cohorts who received National Higher Educational awards during the year 1956-57, it is computed that there were 116,000 pupils enrolled in the related curricula. The enrolment-out-turn ratio in that year was, therefore, 2.4:1. The corresponding figures of enrolment and out-turn during the year 1961-62 were 205,000 and 81,400. The enrolment-out-turn ratio during that year was 2.5:1. As control figures for the interim target year, it is proposed to adopt 750,000 for enrolment and 150,000 for out-turn. The enrolment-out-turn ratio will then be 5:1. This large increase in the enrolment-out-turn ratio is the most important distinguishing feature of the higher educational perspective plan-frame. Such a large increase is proposed because we have postulated a radical reform of the structure of national higher education.

137. At present, National Higher Educational Curricula consists of the following:

> *First, Higher Pedagogical Degree Courses.* These are the B.T. or B.Ed. degree courses which are usually of only one year's duration.
>
> *Secondly, National Academic Degree Courses.* These are the M.A./M.Sc. degree courses which are usually of two years' duration; and
>
> *Thirdly, Professional-specialised Degree Courses.* These are (a) first degree courses (*e.g.*, engineering/medicine) which are usually of four or five

years' duration and (b) second degree courses (e.g., law) which are usually of two years' duration.

If we strike the weighted average of all the courses we shall get the average duration of the National Higher Educational Curricula which is likely to have been somewhat close to 2:1 during 1956-57 as well as 1961-62. The enrolment-out-turn ratio will be somewhat higher than this average duration, as allowance has to be made partly for drop-outs, partly for stagnation and partly also for growth in enrolment during the interval between enrolment and awards.

138. There are a number of different reforms which we envisage as likely to have been implemented during the Perspective Planning Period and which will have the effect of increasing the enrolment-out-turn ratio.

First. Improvement of the organization of higher pedagogical education is an essential feature of planned reform of national higher education. As part of this improvement, we have in view the constitution of two-year courses, admission to which is to be made after the penultimate year of Regional Academic Degree Courses.

Secondly. Existing National Academic degree courses of two years' duration are to be progressively replaced by Academic (Honours) degree courses of four years' duration, for several reasons which have been explained already.

Thirdly. Those professional specialised degree courses which are at present organised as second degree courses are also to be progressively replaced by professional-specialised (first) degree courses organised in the same way as engineering and medical degree courses. New professional-specialised first degree courses are to be organised for "managerial arts". The relative proportion of all such professional-specialised degree courses is to be substantially increased.

Fourthly. Advanced postgraduate courses, promotional-extension courses, and refresher courses are to be organised, though these courses are not taken into account in settling the control figures for cohort out-turn. It is in view of all these considerations for national higher education ratio for nantional higher education is proposed to be raised to 5:1 during 1975-76. It should be added that this is a "ceiling" which should not be exceeded, not a "target" to be striven for.

139. Turning to Regional Higher Education, we note that it comprises (a) all university degree courses (including B.A./B.Sc. degrees) which are awarded in the fourth year following the completion of general high school education; (b) all sub-professional diploma courses; and (c) the Senior Intermediate Course (which counts for enrolment, but not for awards).

In view of this specification of regional higher educational curricula, it may be assumed that its average duration is 3 years. The enrolment-out-turn ratio, we may expect, must be substantially higher than 3:1, in order to allow for drop-outs, stagnation, and the growth of enrolment.

140. During 1956-57 enrolment in regional higher education was 448,000 while the out-turn was 79,000. The enrolment-out-turn ratio was 5.7:1. During 1961-62 enrolment had risen to 686,000 while the out-turn had risen to 129,000. The enrolment-out-turn ratio had registered a drop to 5.3:1. This drop, it may be presumed, was mainly the result of the reorganization of the academic first degree courses which was carried out in parts of the country. The big fall in enrolment which occurred between the Senior Intermediate and the first year of the old two-year B.A./B.Sc/B.Com. degree course is transferred to a lower level and excluded from our reckoning. (It will be recalled that we exclude the enrolment in pre-university courses, alongwith the final year enrolment in higher secondary schools from the figures of enrolment in higher education).

141. We have proposed, as control figures for the Interim Target Year, an enrolment figure of 1,000, against the out-turn figure of 250. Thus we postulate an enrolment-out-turn ratio of 4:1. This implies a programme of reform designed to improve the efficiency of regional higher education, such improvement being reflected in a reduction of the enrolment-out-turn ratio from 5.3:1 in 1961-62 to 4:1 in 1975-76. Conversion of the Senior Intermediate Course into the first year of a three-year B.A./B.Sc. degree course

will be one such reform. We also expect some of the sub-professional diploma courses to be newly developed. These could be two-year courses following the Higher Secondary-Pre-University-Junior Intermediate courses. Also (as mentioned already) the final year of the regional academic degree course is to be counted, where it leads to a reorganised pedagogical course, as part of national higher education.

For all these reasons, a planned reduction of the enrolment-out-turn ratio is both necessary and practicable.

142. The total number of pupils enrolled in higher educational courses (as defined in this report) increased from 564,000 in 1956-57 to 891,000 in 1961-62. The increase was 327,000 over a five-year period. The average annual increase was 65,400. As control figures for the interim target year, we now propose 1,750,000. This represents an increase of 859,000 in 14 years, or an average annual increase of 61,357.

Thus there will be no material reduction in the annual increase of enrolment, even though the expansion in the number of seats in higher educational institutions is to be brought under strict control. This will be possible because the relative proportion of the courses with longer duration is proposed to be increased, as also the number of advanced postgraduate courses, promotional-extension courses and refresher courses.

SECTION 3. EMPLOYMENT OF TEACHERS

143. There were 34,000 teachers of higher educational courses during 1956-57. The number increased to 60,000 during 1961-62. The additional number was 26,000 over a five-year period, representing an average annual increase of 5,200. As the control figure for 1975-76, it is proposed that the number of teachers should rise to 141,000. This will mean an additional number of 81,000 in 14 years; an average annual increase of 5,785.

Allowing 2 per cent for attrition of stock, it will be necessary to recruit about 7,000 new college teachers as the annual average for the Perspective Planning Period.

144. It should be mentioned, in order to avoid possible misunderstanding, that these figures do not include teachers required for the final year of higher secondary education, for the pre-university course and for the Junior Intermediate Course. For purposes of planning, this border-line sub-level is deemed to be included in secondary education and excluded from higher education. In proposing a control figure as above, it is assumed that the average number of pupils per teacher which is computed to have dropped from 17 during 1956-57 to 15 during 1961-62 will drop further to 12 during 1975-76. This drop implies an important policy decision.

145. During 1956-57, it is computed, that the total number of teachers *viz.*, 34 thousand was divisible into 23 thousand employed in regional higher education and 11 thousand in national higher education. The corresponding division of numbers in 1961-62 was 40 thousand and 21 thousand. A substantial shift in the relative proportion is planned for 1975-76, where the number would be 66 thousand in regional higher education and 75 thousand in national higher education. The planned pupil-teacher ratio is 10:1 in national higher education and 15:1 in regional higher education.

SECTION 4. ALLOCATION OF FUNDS FOR DIRECT EXPENDITURE

146. According to the conventional classification of educational expenditure, a distinction is made between "direct expenditure" and "indirect expenditure". The former includes all recurring expenditure brought into account by all educational institutions. It consists mainly of the emoluments of teachers and includes in addition all ordinary recurring charges of maintenance and management of educational institutions. Two main types of expenditure are excluded from the definition of direct expenditure and are treated as "indirect expenditure":

(a) *Non-recurring Expenditure.* This represents capital investment in the expansion and improvement of physical facilities.

(b) *Indirect Recurring Expenditure.* This represents recurring expenditure of a special nature mainly incurred by authorities other than managements of educational institutions. It includes:

(i) Recurring expenditure on scholarships, subsidised provision of hostel facilities, and other forms of student-aid;

(ii) Recurring expenditure on direction, inspection and other functions of educational administration; and

(iii) Other miscellaneous recurring expenditure on educational and cultural services which form part of higher education but are provided otherwise than as ordinary functions of educational institutions or research organizations.

147. We have not attempted to form an estimate of requirements of Indirect Expenditure as specified above. The allocations of funds for "direct expenditure" have been computed and expressed in terms of constant prices of the year 1960-61. Expressed in this way, the total amount was Rs. 28 crores in 1956-57. It rose to Rs. 54 crores in 1961-62, and it is planned to increase it to Rs. 150 crores in 1975-76. The share of this total which was allocated to National Higher Education was Rs. 11 crores in 1956-57; which rose to Rs. 23 crores in 1961-62; and is planned to be raised to Rs. 90 crores in 1975-76.

148. The amounts mentioned above are expressed in crores of rupees at constant 1960-61 prices. For 1956-57, these figures represent the actuals at current prices of that year, increased by 8 per cent. For 1961-62, these figures represent the actuals at current prices of that year, reduced by 2 per cent. The control figures for the 1975-76 are also expressed in terms of constant 1960-61 prices. As the price-level at the end of the Third Plan Period was already substantially higher than in 1960-61, and as it is very unlikely that the price level of that year will be restored up to the interim target year, it follows that the control figures for 1975-76 expressed in current prices must be higher than Rs. 90 crores. How much higher? In theory, the higher figure should bear the same proportion to 90 crores as the increase in the general price level between 1960-61 and 1975-76. In actual practice, the full extent of such increase might not be necessary if the compensatory allowances for teachers cover only a portion of the increase in the general price level. The increase in the control figure (expressed at constant prices) must be at least up to the portion thus covered. Stated broadly, the control figures expressed in constant (1960-61) prices may be deemed to be also the control figures at current prices plus what may be described as "extra dearness allowances" above the 1960-61 level.

149. If the total amount of direct expenditure were divided by the number of teachers employed, we obtain a unit rate of direct expenditure (per teacher employed). This unit rate of direct expenditure (expressed in constant 1960-61 prices) is computed to have been Rs. 8,231 in 1956-57 and it rose to Rs. 9,048 in 1961-62. The control figures indicate that this is proposed to be increased to Rs. 10,640. This is designed to permit a levelling up of some of the salary scales where they were unduly low during 1961-62.

(*Note.* It must not be supposed that the unit-rate of direct expenditure means the same thing as average annual emoluments of teachers. The latter will be smaller. For Direct Expenditure includes, in addition to the emoluments of teachers, many other recurring charges of maintenance and management of institutions).

SECTION 5. SOURCES OF FUNDS FOR DIRECT EXPENDITURE

150. The sources from which 'direct expenditure' is met in every higher educational institution may be grouped under three main heads. They may be referred to as (a) Union Public Funds, (b) State Public Funds, and (c) Fees and Private Contributions. The last item includes, in addition to all fees of all kinds paid by pupils, income from educational endowments, *ad hoc* private contributions and certain miscellaneous items officially described as derived from "Other sources". Table 12 shows at one glance, how direct expenditure was actually met from each of these three funds during the base year 1960-61 (as well as five and ten years earlier); and how it is proposed, it should be met during the Interim Target Year.

TABLE 12. ALLOCATION OF DIRECT EXPENDITURE ON HIGHER EDUCATION BY SOURCES OF FUNDS

		Actual			Proposed for Interim Target Year
		1950-51	1955-56	1960-61	
I.	Total Direct Expenditure (Crores of Rs.)	17·68	29·71	56·88	150·00
II.	Deduct Fees and Private Contributions (Crores of Rs.)	9·18	16·12	27·71	30·00
III.	Direct Expenditure met from Public Funds (Crores of Rs.)				
	Union Public Funds	1·98	3·67	9·17	60·00
	State Public Funds	6·52	9·92	20·00	60·00
	TOTAL	8·50	13·59	29·17	120·00
IV.	Percentage Share of Union Public Funds in Direct Expenditure met from Public Funds	23·3%	27·0%	31·4%	50·0%

Note. The figures for 1950-51, 1955-56 and 1960-61 relate to "higher education" as conventionally classified which differs in certain respects from the classification adopted in this report and which applies to the Interim Target Year. The figures for 1950-51 and 1955-56 are expressed in current prices, while the figures for the Interim Target Year are expressed in constant 1960-61 prices.

151. It will be observed that the figure proposed for Fees and Private Contributions during the Interim Target Year (Rs. 30 crores) is only a little higher than the actuals of 1960-61 and probably smaller than the level already attained at the end of the Third Plan period. The reasons (some of which imply important policy decisions) are set out below:

First. There is some reason to think that the statistics of fee income include a part which is really derived from public funds, but enters institutional accounts as fee income. Part of the amounts shown under "other sources" is also likely to be of similar nature. Thus the true actuals are likely to be smaller than what the statistics show.

Secondly. Enrolment is planned to expand at a much slower rate than direct expenditure as the relative proportion of the courses which are more costly and of longer duration is planned to be increased. The proportion of fees and private contributions to such expenditure is much smaller than in the total.

Thirdly. Governments are under constant pressure to reduce the scales of fees. Though in theory, it should be possible to resist this pressure, in practice it is not. It is proposed to institute strict control of numbers through competitive entrance requirements. This cannot also be combined with the tightening up of fees. On the other hand, a liberal policy in respect of fees is an essential complement of a strict control of numbers. Further, as number increases there will be a larger proportion of poor pupils than at present. In these circumstances the average annual fee income per pupil is bound to fall significantly. Similar considerations apply to private contributions also.

In these circumstances, it would be inexpedient to plan for a larger realisation of fees and private contributions than the amount proposed.

152. If, out of total amount of Rs. 150 crores of direct expenditure, Rs. 30 crores are deducted as met from fees and private contributions, Rs. 120 crores will have to be met from public funds. The next question is how much of this amount should be planned to be met by the Union Government and how much by all the State Governments. The share of the Union Government has been rising from 23.3 per cent in 1950-51, through 27.0% in 1955-56, to 31.4% in 1960-61. Continuing this trend, it is proposed that we should plan for a fifty-fifty division in the Interim Target Year. It follows that Rs. 60 crores should be provided from Union Public Funds and Rs. 60 crores from State Public Funds.

153. For various reasons it is desirable that the Union Government's share of direct

expenditure should be much more substantial in National Higher Education than in Regional Higher Education. It is proposed that out of the total amount of direct expenditure chargeable to public funds the relative proportions of the Union Government and the State Governments should be 3:2 in respect of National Higher Education and 1:2 in respect of Regional Higher Education. On this basis, the sources from which the total amount of Rs. 150 crores may be met during the Interim Target Year are shown in Table 13.

TABLE 13. (PROPOSED) ALLOCATION OF DIRECT EXPENDITURE ON HIGHER EDUCATION IN THE INTERIM TARGET YEAR, BY SOURCES AND LEVELS

(In Crores of Rupees)

	National Higher Education	Regional Higher Education	Total
1	2	3	4
Union Public Funds	45	15	60
State Public Funds	30	30	60
TOTAL PUBLIC FUNDS	75	45	120
Fees and Private Contributions	15	15	30
GRAND TOTAL	90	60	150

154. It may be recalled that all the financial proposals are limited to direct expenditure. No estimates have been offered for "indirect expenditure". The two most important items of indirect expenditure are "buildings" and "scholarships". The relative proportion of expenditure on these two items has been increasing rapidly. This must obviously continue. The success of the proposed reforms will depend entirely on the provision of scholarship facilities which will ensure that no pupil who gains admission to national higher education (and manpower-planned courses of regional higher education) is prevented by poverty from pursuing his studies. This will entail important reforms in the present arrangements for provision of scholarships including the development of a system of "scholarship loans". Successful working of such a system will facilitate (and, in turn be facilitated by) linking education with employment.

155. An item of "indirect expenditure" to which greater attention should be devoted than at present is "educational administration". There is urgent need for strengthening the organization of higher educational administration, and, therefore, for better financial provision therefor.

156. While no estimates of probable growth of indirect expenditure are offered, two further observations may be made about related policy:

(1) It is essential that adequate parallel provision should be made for indirect expenditure alongwith the planned growth of direct expenditure. They must grow together in due proportion.

(2) The Union Government should take larger responsibility for indirect expenditure than for direct expenditure. It is suggested that the Union Government should meet 100 per cent of indirect expenditure on National Higher Education and 50 per cent of indirect expenditure on Regional Higher Education.

CHAPTER VII. PROPOSED SCHEME OF SPECIFICATION OF EXECUTIVE RESPONSIBILITY OF THE GOVERNMENT OF INDIA AND EACH OF THE STATE GOVERNMENTS, AND STATUTORY BASIS THEREFOR

SECTION 1. PRELIMINARY REMARKS

157. This report began with a statement of four specific recommendations. The succeeding chapters were devoted to elaboration of the meaning and purpose of these recommendations and their implications for changes in existing policies, programmes and organizations. The first of the four specific recommendations stated that the "Government of India and all the State Governments should agree upon and adopt a statement of All-India policy on Manpower Planned development and reform of higher education". The terms of this recommendation also specified under five heads the premises and objectives of such All-India policy. We now assume that enough has been said in the preceding chapters to make it clear what is meant by "manpower planned development and reform of higher education", to carry conviction about its necessity and, thereby, to persuade the Government of India and all the State Governments to accept this recommendation and adopt an agreed statement of All-India policy.

158. As part of the second of the four specific recommendations, the draft of a "Higher Educational Perspective Plan-Frame" was put forward and it was recommended that "the Government of India and all the State Governments should jointly take the draft into consideration, examine the implications thereof; and, in the light of the consensus reached in such examination, finalise and settle the control figures and agree to adopt the higher educational perspective plan-frame as the common All-India basis for formulation of programmes of development and reform".

159. It has been stated over and over again in the preceding chapters and it is finally emphasised at this stage once again that the particular figures put forward as control figures in the draft higher educational perspective plan-frame are not sacrosanct. Different figures may be decided upon by all the Governments jointly when they finalise the draft, so long as the need for quantifying the statement of All-India policy in a frame-work of targets and ceilings is accepted by all the Governments jointly. We now assume that enough has been said in the preceding chapters to elucidate the meaning, purpose and implications of the proposed target and ceiling and that all the Governments concerned will accept and give effect to the recommendation about the Higher Educational Perspective Plan-Frame.

160. After achieving agreement on a common All-India policy and a frame-work of targets and ceilings as the common All-India basis for planning programmes of development and reform in pursuance of that policy, it will become necessary to specify the nature and extent of executive responsibility to be severally undertaken by the Government of India and each of the State Governments in respect of planning and implementing specific schemes of development and reforms. It is necessary to do this because only then will it become possible for each Government to examine the administrative machinery already functioning in the field of executive responsibility assigned to it and bring about those changes in the machinery which have to be made in order that the Government may be adequately equipped for discharging its responsibility. These changes have to be brought about, however, on the basis of joint agreement because only thus will it be possible for the organization of the Union and the organizations of the States to work in mutual coordination with one another. It is in the light of these considerations that certain specific suggestions are offered in the next section of this chapter. We may now recall the third of our four specific recommendations which states that "the Government of India and all the State Governments should jointly take these suggestions into consideration and in the light of the consensus reached on such examination, finalise and settle a scheme of specification of executive responsibility of the Government of India and of the State Governments".

161. The starting point of the entire process of manpower-planned development and reform of higher education is "number-control". The creation of new seats in every

higher educational institution which is recognised as forming part of the national educational system must be controlled with reference to the plan requirements. Competitive entrance requirements will have to be instituted and the machinery and procedure for making selections will have to be settled. This settlement will be based on considerations of policy which seek to reconcile the requirements of economic and educational efficiency with the need for provision of equal opportunity, as well as the need for providing special assistance to the educationally and economically backward classes of citizens. Recruitment, training and employment of higher educated manpower by educational institutions, government departments and corporations will have to be brought under regulation so as to facilitate the coordination of educational preparation with the requirements of employment agencies. All these and other reforms will require legislative sanction. When legislative sanction is provided for reforms which are accepted as being necessary in the public interest, it is not only usual but also necessary that legislative provision should be made for the framework of needed administrative machinery. This is especially necessary when such machinery has to be assembled, in separate parts, by the Union Government and each of the different State Governments and set to work together as if they formed different parts of one and the same organization on an All-India basis. In devising such machinery, we do not need models from other countries. There are enough models in the complex administrative organization of this vast country. What is now necessary is the application to new conditions of principles of administrative organization which are already well-established. We offer our suggestions in regard to the setting up of needed administrative machinery in the later sections of this chapter.

162. It is generally assumed that the Constitution has allotted sovereign powers to the States in the sphere of education; and that the Union Government cannot perform educational functions effectively unless the Constitution is amended. We do not think that there is any need at all for amending the Constitutional provisions which define the demarcation of functions between the Union and the States. It is entirely possible for the Government of India and all the State Governments to agree upon a scheme of specification of executive responsibility (such as has been proposed in this report) which will be completely consistent with the constitutional division of functions. What we really need is unreserved agreement by all the Governments on the basis of conviction of necessity and practicability. When such an agreement is reached, the legislation proposed will constitute the ratification of that agreement by the legislatures concerned. An assured statutory basis will then become available within the framework of the existing Constitution which will enable the Union Government to perform the functions undertaken by them. With this explanation, we may now recall the fourth of our four specific recommendations which states that "appropriate Acts of Parliament and State Legislatures should be enacted, so as to provide the statutory basis required for manpower planned development and reform of higher education in India up to the Interim Target Year". We trust that the suggestions which are offered in the succeeding sections will not only establish the need for accepting this recommendation but also indicate how the recommendation may be implemented.

SECTION 2. HIGHER EDUCATIONAL FINANCE AND ADMINISTRATION: (PROPOSED) DIVISION OF FUNCTIONS BETWEEN THE UNION AND STATES

163. Certain institutions are specified by name in items 62 and 63 of the Union List of the seventh schedule of the Constitution. The administration of these institutions is a function of the Union. Other institutions of a like nature may also be "declared by law to be institutions of national importance". Upon such declaration, the administration of these institutions will form part of the functions of the Union. Item 64 of the Union List of the seventh schedule of the Constitution establishes a similar position in respect of another class of institutions, namely, "institutions for scientific or technical education financed by the Government of India wholly or in part and declared by Parliament to be institutions of national importance".

164. Parliament should be moved to undertake legislation based on the foregoing items in order to establish a Statutory All-India List of national higher educational institutions. Every recognised institution in the country which imparts "national higher education" according to statutory standards should be eligible for inclusion in this list, irrespective of whether it is a private or public institution and irrespective of whether it is maintained or aided by the

Union Government or by a State Government. Additions to or deletions from this list should be made only by Parliament.

165. There should be three separate parts of the Statutory List which may be referred to as Part A, Part B, and Part C. The Act of Parliament should specify the nature and extent of the duties and powers to be performed and exercised by the Union Government and the State Government concerned in each of the three parts. The Act should authorise the Government concerned, in its respective sphere, to make grants as well as to frame and enforce administrative regulations. All institutions included in the same part should be eligible for the same financial benefits and should be subject to the same liability to conform to administrative regulations. The nature and extent of executive responsibility (financial as well as administrative) to be undertaken by the Union Government will differ from one part to another. The act of Parliament should prescribe a ceiling for aggregate capacity (measured by number of seats) of all institutions included in each of the three parts of the Statutory List. A ceiling of 50,000 seats for each part, with 1,50,000 seats in all is suggested.

166. **Institutions included in Part A of the Statutory All-India List of National Higher Educational Institutions.**

(1) *Financial Responsibility*. The Union Government will have undivided responsibility for provision, out of Union Public Funds, of grants required to meet all expenditure which is not covered by fees and private contributions. The State Government will have no financial responsibility.

(2) *Duties and Powers of Framing and Enforcing Administrative Regulations*:

They will vest entirely in the Union Government which will have undivided executive responsibility. As in respect of all other Union functions, the State Government will be under constitutional obligation to perform such agency functions, if any, as may be entrusted by the Union Government.

167. **Institutions inclued in Part B of the Statutory All-India List of National Higher Educational Institutions.**

(1) *Financial Responsibility*. Financial responsibility will be divided between the Union Government and the State Government concerned as below :

(a) The Union Government should provide an annual grant out of Union Public Funds to each institution separately so as to cover the entire amount of non-recurring expenditure; the entire amount of expenditure on scholarships and other forms of student aid; and the entire amount of expenditure on pay, allowances and other emoluments of all teachers. The scales of expenditure on these purposes will be regulated by the Union Government.

(b) The State Government should provide grants out of State Public Funds to cover all the institutional expenditure on all purposes other than those mentioned in (a) above and other than such expenditure as may be covered by fees and private contributions.

(2) *Duties and Powers of Framing and Enforcing Administrative Regulations*:

(a) Administrative regulation of programmes, and administrative regulation of teacher employment will vest in the Union Government.

(b) The duties and powers of administrative regulation in respect of all other matters (including pupil-enrolment, financial management and general management) will vest in the State Government.

168. **Institutions included in Part C of the Statutory All-India List of National Higher Educational Institutions.**

(1) *Financial Responsibility*. Financial responsibility will be divided between the Union Government and the State Government as below:

(a) The Union Government should provide an annual grant out of Union Public Funds to each institution separately so as to cover the entire amount of non-recurring expenditure and the entire amount of expenditure on scholarships and other forms of student-aid. The scales of expenditure on these purposes will be regulated by the Union Government. There will be no statutory commitment about sharing direct expenditure, but the Union Government will be authorised to share the expenditure in cases of necessity.

(b) The State Government should provide grants out of State Public Funds so as to cover all the institutional expenditure other than those mentioned above and other than such expenditure as may be covered by fees and private contributions.

(2) *Duties and Powers of Framing and Enforcing Administrative Regulations*:

(a) Administrative regulation of programmes will vest in the Union Government.

(b) Administrative regulation in respect of all other matters will vest in the State Government.

169. No higher educational institution will be initially included in the Statutory All-India List, unless the management of such institution shall have made an application for such inclusion and specifically declared its willingness to conform to administrative regulations. This exemption from compulsory inclusion will apply as much to institutions maintained by State Government and to universities, as to private institutions. After the institution is included in the List, the statutory provisions will continue to apply so long as it remains in the list. The institution cannot contract out of its obligations by unilateral decision. Deletion from the list cannot be claimed by mere withdrawal of application. Parliament may, however, delete an institution from the list either on its initiative or on application.

170. All courses of "Regional Higher Education" as defined in this Report may be referred to as "sub-professional specialised education" with the exception of the B.A./B.Sc. degree courses which may be referred to as "Regional Academic Arts/Science education". Sub-professional specialised courses will include the following: (1) The B.Com. degree and similar regional higher educational awards other than the B.A./B.Sc. degrees; (2) The diploma courses at present provided in polytechnics; (3) Similar diploma courses for the educational preparation of technicians needed for agricultural, veterinary, public health and medical services; (4) Similar diploma courses to be developed for teacher-training; and (5) Similar diploma courses, to be developed for educational preparation combined with pre-employment training of higher educated manpower cohorts required for employment in ministerial or subordinate supervisory posts in Government Departments and Corporations. It has been mentioned repeatedly and it is finally re-emphasised that the development of sub-professional specialised education for all these purposes, is a very important part of the programmes of manpower-planned development and reform of higher education. It is on this part of the programmes that every State Government should concentrate its attention and resources.

171. As a rule, the Union Government should not undertake any financial or administrative responsibility for "Regional Academic Arts Education". The State Government should have the entire responsibility for effecting the needed curbs on growth at this level and the avoidance of higher educated unemployment or wasteful under-employment. On the other hand, the Union Government should extend active and effective assistance to State Governments in framing and implementing planned programmes of development of sub-professional specialised education. The Union Government should also provide assistance on a selective basis to educationally backward states in developing "Regional Academic Science Education".

172. A certain proportion of sub-professional specialised institutions may be earmarked for meeting the requirements of the public corporate industrial or commercial enterprises of the Union Government or any major departmental agencies of the Union Government. This will be particularly needed in respect of polytechnics located in the vicinity of public corporate industrial enterprises of the Union Government. In such cases, the institutions may be brought under the same form of administration as institutions included in Part A of the Statutory All-India List referred to above. Other institutions (including regional academic science colleges in special cases) may be administered on the lines proposed earlier for Part B or Part C institutions. As the number of institutions is likely to be large, and as there is need for *ad hoc* arrangements for a number of years before a system can get settled, it will not be advisable to make statutory provision for Union Government participation in regional higher education, except perhaps in the field of engineering and technology. Even though no statutory provision is made, the aim should be to approximate the pattern of division of financial and administrative responsibility in

respect of regional higher education to that of national higher education.

Section 3. Machinery of Higher Educational Administration: Engineering and Technology Branch

173. Earlier in this report, we observed that the organization which has grown up during the last decade for purposes of development of engineering education offers a working model which may be usefully adopted for other types of specialised higher education. The characteristic features of this organisation are the following:

(1) An All India plan envisaging targets of growth of the national stock and targets of increase of higher educational capacity derived therefrom.

(2) An effective system, agreed upon between the Government of India and the State Governments, for reaching decisions regarding the distribution of new capacity among the different states.

(3) A similar effective system for assuring the availability of funds for meeting both recurring and non-recurring expenditure on a continuing basis.

(4) (a) An All-India Council of Specialised Higher Education attached to an appropriate Ministry of the Government of India with coordinating committees, with an organised permanent staff; and

(b) A Board of Specialised Higher Education in each State, attached to an appropriate department of the State Government, with an organized permanent staff.

174. We have also pointed out that the first phase of development in which the rapid setting up of new institutions and expansion of old institutions on a planned basis was the main task is now drawing to a close and a second phase is beginning in which different and much more difficult tasks have to be undertaken. It is in this context that we suggest steps to strengthen the present organization.

175. It has been mentioned already that "a progressive and orderly change-over from the present 'standard' pattern to the proposed 'cooperative' pattern of engineering education at degree level is to be planned and carried out. Similar reform has to be planned and carried out in respect of polytechnic education at diploma level also ....it will be impossible to make a beginning with these measures unless the agencies which employ engineering man-power take parallel action and important reforms are carried out in their policies and practices regarding recruitment, pre-employment training, promotions and provision of facilities for in-service development including institutional education of the 'extension pattern'. The nature of the changes required to be made in existing organizations may be reduced from the foregoing description of the new tasks."

176. The needed changes are suggested below:

I. There is at present a Council known as the "All India Council of Technical Education", with one "Central Coordination Committee" and four "Regional Committees". They are set up by executive order of the Union Government. There is a Board of Technical Education in each state set up by executive order of the State Government. The entire organization comprising these bodies should be placed on a statutory basis under an Act of Parliament, with changes in designation, and functional and territorial jurisdictions as below:

(1) The Council should be styled the All India Council of Engineering and Technological Education.

NOTE. "Engineering Education" and "Technological Education" should be defined. The definition should exclude such subjects as "pharmacy", "commerce" and "applied arts" which are at present included. Educational preparation for all arts which are based on the practical application of the principles of mathematics and the non-biological sciences of nature to the processes of production, transportation and communication should be included.)

(2) There should be one "Central Planning and Finance Committee" and Five "Zonal Programme Committees". The territorial jurisdiction of each Zonal Programmes Committee should be each of the five zones as constituted under the States Reorganization Act.

(3) The chairman of each of the five Zonal Programme Committees

should be a member of the Central Planning and Finance Committee also. All the members of all the five committees should also be members of the council. The members of the council who are not members of the five committees should not exceed one-tenth of the total strength of the council.

(4) There should be a State Regional Board in each State-Region.

(NOTE. One state will ordinarily constitute one State-Region. But a State may be divided into more than one State-Region, if necessary.)

II. (1) The functions at present vested in the University Grants Commission in relation to all universities, as well as the functions at present vested in the Council set up under the Institutes of Technology Act in relation to all Institutes of Technology should be transferred to and distributed between the new All India Council of Engineering and Technological Education and the new "Central Planning and Finance Committee" of that Council. The functions thus transferred should be performed by these bodies in relation to all institutions of engineering/technological education which may be included in the Statutory All-India list of National Higher Educational Institutions. Upon such transfer, the provisions of the University Grants Commission Act should cease to apply to the institutions concerned. The provisions of Chapter III of the Institutes of Technology Act should stand repealed.

(2) The functions of the Zonal Programme Committees and State-Regional Boards should be defined so as to be the same as those performed at present by Regional Committees and State Boards subject to such changes as may be deemed necessary in the light of practical experience and subject to the addition of new functions under III below.

III. There is at present no provision of law by which employers may be compulsorily required to provide practical training facilities to pupils enrolled in institutions of engineering and technological education before or after they receive their degrees or diplomas and before they enter upon their first employment. The provisions of the Apprentices Act 1961 are limited to trades notified as "designated trades". They are expressly declared to be inapplicable to "any graduate or diploma apprentice undergoing training in accordance with any scheme framed by or with the approval of the Government" or to "any special apprenticeship scheme for imparting training in non-designated trades". The new Act of Parliament should make statutory provision for these excluded types of training, as nearly as may be on the lines provided in the Apprentices Act 1961. The functions to be performed under the Act should be distributed between the Zonal Programme Committees and the State-Regional Boards. The new provisions should secure that the total number of trainees for whom any employer may be compulsorily required to provide training facilities is not increased, beyond the limit established by the Apprentices Act 1961.

177. The purposes underlying the foregoing proposals are clear. It may be added that the successful working of any organization depends not merely on its formal structure but on the manner in which men are chosen for appointment to key posts in it. It is with reference to this consideration that the following observations are made.

(1) So far, the organization has been controlled effectively by engineering educationists. This was useful and appropriate during the first phase of development. It is now necessary to secure that the Zonal Programmes Committees are effectively controlled by members who represent the Government departments and corporate enterprises which employ engineering manpower. This should be done without prejudicing the educational character of the organization as a whole, and more particularly the functions of its Central Planning and Finance Committee.

(2) Owing to historical reasons, the civil engineering speciality (being the oldest and best developed) is heavily represented in key posts both in Government departments and in educational institutions. Professional engineers of specialities other than civil engineering, with

adequate practical experience of industrial production should be given effective representation at all levels, and especially in the Zonal Programme Committees.

SECTION 4. MACHINERY OF HIGHER EDUCATIONAL ADMINISTRATION: OTHER BRANCHES

178. It is convenient, for administrative purposes, to divide all degree and diploma courses which comprise higher education under six branches of higher education as specified below:

Scientific and Technical Educational Branches.

(1) Academic-Pedagogical Science Education.

(2) Engineering and Technological Education.

(3) Agricultural and Veterinary Education.

(4) Health and Medical Education.

Arts Educational Branches.

(5) Academic-Pedagogical Arts Education.

(6) Specialised Arts Education.

179. The following classification by branches is the same as adopted in Part II of the (Draft) Higher Educational Perspective Plan-Frame with the difference that what is referred to in the latter as "Specialised Scientific and Technical Education" (other than Engineering Education) has been split into three parts. Two of these parts are given branch number 3 and 4 above. The remaining part constitutes the definition of "Technological Education" and is added to branch number 2. The word "technical" is used to signify the sub-professional level of education in branches 2, 3 and 4. Educational preparation for public administration and corporate management is included in branch 6, along with educational preparation for self-employment or other non-corporate employment in commerce, law, journalism or any other specialised cultural or social art, but not including technological and technical arts as defined above.

180. We have explained in the last section our views regarding the machinery of higher educational administration required for branch number 2. That machinery is to be set up and administered by the Union Government in the Ministry of Education.

We suggest that the machinery of higher educational administration required for branch number 3 should be organized on the same pattern; and should be set up and administered by the Union Government in the Ministry of Food and Agriculture.

We also suggest that the machinery of higher educational administration required for branch number 4 should be organized on the same pattern and should be set up and administered by the Union Government in the Ministry of Health.

In all three cases, there must be self-contained provision for finance; the branches being specifically excluded from the purview of the University Grants Commission.

181. We have now got to consider the machinery of higher educational administration required for branches number 1, 5 and 6. Should these be three separate organizations or should one be kept separate and the two others unified in a single organization? Or should all three be unified in a single organisation? Different views may be held by different persons about the right choice to be made. There is no such thing as a uniquely valid solution to any problem of organization. The choice has to be made on a balance of advantages and disadvantages. We suggest that (for the duration of the Fourth and Fifth Plan Periods) it would be best to have a single unified organization for these three branches, *viz.*, Academic-Pedagogical Science; Academic-Pedagogical Arts; and Specialised Arts.

182. The nucleus of the needed organization already exists. It is the University Grants Commission. It is, however, only a nucleus. It may be seen from Part II of the (Draft) Higher Education Perspective Plan-Frame that (measured by annual outturn of cohorts, the unified organization dealing with branches 1, 5 and 6 will have at least twice as much work to do as the three other separate organizations, each of which will be dealing only with one branch. It will be necessary therefore, to secure that the existing organization of the University Grants Commission is reformed and strengthened so as to be adequate and suitable for its tasks. Energetic leadership is needed in order to assist all the universities of the country to perform their functions effectively. It is only when this is done that the nation will be equipped with an efficient system of educational preparation of

all higher educated teachers in schools, colleges and universities; of all academic research workers in all the arts and sciences; of all non-technical administrators and managers in all Government Departments and corporations; of all lawyers, authors, journalists and other private practitioners of specialised arts; and, generally, of all other higher educated manpower needed by the country (with the exception only of engineering and technological specialists, agricultural and veterinary specialists, and health and medical specialists). Each of these three excepted groups of higher educated manpower will be the responsibility of one of the three other specialised agencies and the specialised institutions which will be assisted and guided by them.

SECTION 5. UNION CORPORATE SERVICE COMMISSION

183. The following passage occurs in one of the papers issued last year by the Institute of Applied Manpower Research:

> "There is a story of an amusing character (created by a famous French playwright) who started taking tuition in the literary arts somewhat late in a busy life devoted to commercial pursuits. When he came to the point at which he was instructed about the distinction between poetry and prose, he is said to have exclaimed with surprise that he had been 'talking prose for forty years, without knowing it'. In somewhat similar fashion, there must be some administrators in India who have taken part in planning and implementing schemes of reorganization of services. There must be many more who have made sophisticated cadre calculations in order to plan and carry out recruitment programmes. All these administrators have, in fact, been doing 'manpower-planning'; though, like M. Jourdain, they may have done so 'without knowing it'."

184. After explaining how "manpower-planning" is really a matter of setting up and coordinating a system of planned management of manpower employed in a complex net-work of organizations, the paper goes on to explain why this long-familiar technique of administration has suddenly assumed the size, shape and name of a new problem.

> "There is a large body of rules and regulations in all Ministries and Departments of all Governments in India which normally take care of the foregoing requirements. The rules and regulations were originally devised under conditions in which the total number of Service-Cadre-Posts were expected to be relatively stationary or to increase only very slowly. During recent decades, however, the rate of growth has increased. What is no less important is that, the relative proportions of Service-Cadre-Posts at different levels have also altered. Where the effect of these changes was appreciated in time and was recognised to be permanent, remedial action has been taken in the form of replanning the Service Cadre. Reorganization of services based on such replanning has often entailed considerable expansion of total cadre-strength requiring special recruitment on an *ad hoc* basis. It has also entailed the revision and resettlement of the levels at which direct recruitment is made as well as the specification of sources from which recruits are to be drawn.
>
> "For various reasons, noted reorganization has not been effected, at all, or has not been effected satisfactorily in many cases. The principal reason is that administrators who know how to manage an existing cadre are available in large numbers. Too few among them know how these cadres were originally designed or brought into existence. Another, and perhaps, more important reason is that even those who understand how cadres are designed, are familiar only with the organization of what may be called 'static' cadres. But the country needs 'dynamic' cadres; cadres with built-in provision for much more rapid growth than the old-type cadres.
>
> "The creation of new public sector enterprises has proceeded very fast in recent years and has taken varied, complex, and hitherto unfamiliar forms. These enterprises require the constitution of 'dynamic' cadres. They have not yet been constituted. It is here that a major problem of planned encadrement has arisen and awaits

> early solution. There are some misconceptions which are, at present, obstructing and delaying the solution of this problem. It is necessary that these misconceptions should be brought into the open and cleared away". The paper proceeds to set out these misconceptions and explains how they should be cleared away.

185. It is worthy of note that the major problem which is thus identified as having emerged with the "creation of new public sector enterprises" has also been identified, quite independently, and that too on the high authority of the Estimates Committee of Parliament. The following passages occur in the Fifty-Second Report of that Committee entitled "Personnel Policies of Public Undertakings", which was issued in March, 1964.

> "That every enterprise should have proper written recruitment rules understood by all, from the very beginning, needs no emphasis. It is noticed that even undertakings set up as far back as in 1948 and 1950 have not framed their recruitment rules nor have the administrative ministries concerned ensured their formulation....

> "The basic essential prerequisite to ensure the recruitment of the most suitable man for each post, is to clarify and define the specifications and requirements of each level of management, each department and each key job or groups of similar jobs...... The other undertakings have generally laid down the duties and responsibilities of the various categories of staff but have not properly defined job specifications for each level of officers/staff....

> "Staffing and recruitment in public undertakings is not planned in good time. Such planning is necessary in the context of the present shortage of specialised and technical staff and the time lag between advertising the vacancies and final recruitment........ They, therefore, consider that it would be helpful if annual job inventory is prepared by each undertaking in the light of its need and expansion programmes and action to effect recruitment is initiated in good time....

> "The Committee find that as many as 4,857 technical/managerial personnel have left the public undertakings during the last three years........ If the migration results in higher utilisation of a man's qualifications it is not undesirable. Otherwise it is a waste........ The desirability of devising somewhat uniform scale of pay for similar posts in all public undertakings may be considered.... They have also suggested the introduction of Cadre and Career development schemes by all undertakings...... The Committee hope that Government would...... take suitable measures to arrest the horizontal movement of personnel to the extent it is considered undesirable ....

> "The Committee regret to observe that even undertakings set up as far back as in 1948 or 1950 have not laid down any promotion rules...... That promotion should be based on well-defined principles which inspire confidence in the employees needs no emphasis......

> "Promotions of persons with inadequate experience and training affect the efficiency of the undertakings.. .... The fact that public undertakings have not yet been able to build up efficient management, would indicate that this aspect is not being given the attention it deserves.

> "In order to attract the best candidates available for a post, the...... Corporation has constituted a Cadre Scheme for each group of allied jobs requiring the same basic qualifications...... The Cadre Schemes indicate the number of posts at each of the various levels in which the Cadre is divided and prescribe the minimum experience required for promotion from one level to another.... Such a scheme, operated along with a regular seniority list of officers belonging to a cadre has the advantage of ensuring persons belonging to the Cadre that, subject to their own merit, they could look forward, at given intervals in their career, to higher and still higher posts. .They recommend that all public sector undertakings, of adequate size, particularly the multi-unit undertakings,

> should constitute similar cadre schemes......

"With a view to offering an employee a satisfying career for the whole of his working life, the progressive Companies in India and abroad have devised a regular career development scheme. This envisages constant training for development by inculcating new and related skills in the employee so that he may take over higher responsibilities when opportunities present themselves. They suggest that the desirability of introducing a similar scheme in all public undertakings might be considered...."

186. The Estimates Committee has not only pinpointed in great detail every aspect of planned manpower management which requires to be attended to, it has also made a specific recommendation regarding the machinery required for ensuring that such attention will, in fact, be given. Nearly ten years ago, the Estimates Committee recommended in its report for (1955—57) the constitution of a "Separate Public Service Commission for recruitment of officers in public undertakings". The recommendation was reiterated in the report for 1958-59. Again, in the report for 1962-63, the Committee dealt with possible objections to the proposal and observed that "The problem is one of reconciling the requirements of public responsibility and regularity on the one hand and adequate business and commercial freedom on the other. They feel that the solution lay in establishing a Personnel Commission, similar to the U.P.S.C., for public enterprises, staffed by people with business experience who understand the need of the public sector. The functions of such a Commission should, *inter alia*, be to examine and approve the terms and conditions of service recruitment, promotion and other personnel policies devised by various public undertakings and prescribe model rules. The Commission can also provide members for being co-opted on departmental recruitment and promotion Committees of public undertakings......The Committee would urge that Government decision be taken at an early date in the light of the above observations".

187. In its report issued in March, 1964, the subject was dealt with again in the following terms:

> "The Committee do not visualise any difficulty in the arrangement suggested by them which has been successfully followed in the case of Railways, Posts and Telegraph Department, Ordinance Factories etc. On the other hand, they feel that such a centralised recruitment for higher posts would enable uniform standards of selection, eliminate competitive bidding for scarce personnel and ensure fairness, besides saving the time and work of the public undertakings. The Committee have no doubt that the representatives of the undertakings concerned and suitable outside experts will be associated with recruitment of personnel through such a Commission. If, however, the setting up of a single Central Commission may not be considered feasible, the Committee would suggest the setting up of such Commissions on regional or industry basis."

188. It is now more than two years since the foregoing observations were published. Yet nothing has happened. We have reproduced all the relevant passages from the report of the Estimates Committee because (if we may so observe with due respect) we are entirely and unreservedly in agreement with the diagnosis of the malady as well as the remedy prescribed by the Committee. Our interest in the subject arises from the fact that unless the recommendations of the Committee are accepted and implemented, there is no possibility whatever of successful implementation of the policy which we have recommended in this report.

It is necessary that there should be an efficient system of planned-manpower management in every public sector corporation as well as in every Government department. It is further necessary that these systems should be based on uniform principles and the administration of these systems should be coordinated by a limited number of agencies. This is necessary in order that the annual demand for higher educated manpower cohorts (at least at the national level) may be aggregated, speciality by speciality and matched with the annual supply of such cohorts. Such aggregation is also necessary in order to organize pre-employment training of probationers as well as apprentices; and to link up such training with the reforms to be carried out in the institutional education. It is not possible to make even a beginning in this direction so long as the conditions described by the Estimates Committee continue to prevail.

These conditions cannot be improved upon unless the remedy suggested by the Estimates Committee is adopted.

We recommend, accordingly, that a new organization, which may be referred to as the *"Union Corporate Services Commission"* be set up without delay with its composition and functions defined in the manner specified by the Estimates Committee. We think one such new organization should be sufficient, at any rate, to begin with.

SECTION 6. UNION MANPOWER AUTHORITY AND STATE MANPOWER AUTHORITIES

189. "Manpower" is recognised by the Union Government to be an important item of Government business. The Ministry of Home Affairs has been designated as the unit of the Union Government responsible for transacting this Government business. There is a Director, with a small office staff, located in the Ministry for dealing with the business. Four years ago, the Ministry set up the "Institute of Applied Manpower Research" and charged it with the duty of conducting research on problems of manpower planning. This report is based primarily on the results of research studies made by this Institute.

190. During the last few years, doubts have been expressed (both within the Ministries of the Union Government and by foreign consultants) about the correctness of the location of this function in the Ministry of Home Affairs. Should it not be located in the Planning Commisison which deals with planning? Or in the Ministry of Labour and Employment which deals with employment and training? Or in the Ministry of Education which, after all, deals with the sources of supply of educated manpower? Or in the Ministry of Industry which is concerned with all the new enterprises that will increasingly use manpower? Or in the Ministry responsible for coordination of economic affairs? There is, no doubt, a valid point underlying each of these questions. And, as we remarked earlier, there is no such thing as a uniquely valid solution of any organizational problem. But, given the acceptance of the view put forward in this report that "manpower planning", as a governmental function, is really an extension and adaptation to the new conditions of planned development of the national economy, of those functions which the Ministry of Home Affairs has always performed in relation to public services, we have no doubt whatever that the present location of this function is the correct one.

191. Assuming that the statement of All-India Policy recommended at the outset of this report will be accepted, and assuming further that a scheme of division of executive responsibility for implementation of the policy, as between the Union Government and the State Governments will be also accepted, then we recommend the following improvements in existing organization:

(I) The responsibility for implementation of the policy, as well as the Higher Educational Perspective Plan-Frame (which constitutes the framework of targets and ceilings) should be vested in the Ministry of Home Affairs. The needed machinery should be located in that Ministry and it may be referred to as the Union Manpower Authority.

(II) The Union Manpower Authority should consist of

(1) The Union Manpower Policy Committee;

(2) The Union Manpower Planning Board; and

(3) The Union Office of Manpower Planning.

The Committee should be a Minister Level Committee. The Board should be a Secretary-level Board. The office should be based on the existing Directorate of Manpower in the Ministry of Home Affairs.

(III) Every State should equip itself with a State Manpower Authority, constituted on the same lines.

(IV) The Institute of Applied Manpower Research should be reconstituted as a common service agency of the Union Manpower Authority and all the State Manpower Authorities. Necessary changes in its present constitution should be effected so as to give effect to the foregoing concept of its purpose.

192. It will be the general responsibility of the Union Manpower Authority and the State Manpower Authorities to keep under continual review the progress of implementation of the All-India policy of manpower-planned development of Higher Education in the Union as well as in all the States. Without prejudice to the generality of this statement of their functions, the following major fields of activities may be particularised.

First. A steady flow of continuing information relating to the employment of higher educated manpower in all Government Departments (of the Union as well as the States), all major corporate enterprises (in the private as well as the public sector) and in all educational institutions has to be organized and maintained. The study of such information should be organized and the results of such study should be made available for public information as well as for use by the Union and State Manpower Authorities.

Secondly. The basic principles and framework of organization of planned-manpower management in the Government Departments and public sector corporations of the Union should be settled by the Union Manpower Authority. Measures necessary for setting up employment coordination agencies and the settlement of questions of policy relating to them will be an important function of the Union Manpower Authority. The State Manpower Authority should perform similar functions in relation to the Government Departments and public sector corporations of the State.

Thirdly. A continuous watch should be kept over the progress made by educational institutions in making available an annual supply of higher educated manpower cohorts and the progress made by employment agencies in recruiting, training and employing such cohorts. In the light of the results of such study, the programme relating to each of the four major occupational groups of higher educated manpower, as well as separately for each important speciality in such groups, should be kept under review. In the light of the results of such review, such changes in programmes as may be necessary should be decided upon by the Manpower Authority (of the Union or any State as the case may be).

193. If the organization is developed on these lines, it should be possible, within three or four years, to reach a state of high efficiency in the organization of planned-manpower management in the Government Departments and Corporations and the coordination of such management by agencies set up for that purpose. This will permit a Higher Educated Manpower Budget to be settled and operated annually. When this is done, it will be possible to assure the planned matching of the annual supply of higher educated manpower cohorts with annual recruitment, pre-employment training and placement in first employment of such cohorts; such matching being effected speciality by speciality. This will be the final test of successful implementation of the All-India policy recommended in this report.

194. It is suggested that statutory provision should be made by Act of Parliament for setting up the foregoing organization. The necessary constitutional basis for such statutory provision is available in the following items of the concurrent list of the Seventh Schedule of the Constitution:

Item 20. Economic and social planning

Item 23.......... Employment and unemployment.

Item 26. Legal, Medical and other professions.

195. For purposes of statutory specification of executive responsibility for higher educated manpower-planning including the regulation of employment of higher educated manpower and other related functions which may be required to be performed under All-India policy, we may distinguish between "professional manpower", "sub-professional manpower" and "other higher educated manpower". The distinction may be effected in the manner specified below:

(1) *Professional Manpower* may be defined as comprising (a) all qualified holders of "Professional Posts" and (b) all other qualified persons who are gainfully employed in "Professional occupations".

A "Professional Post" may be defined as an educationally classified post maintained in any establishment of a Government Department or a corporate enterprise or institution, provided that the holder of such post is ordinarily required by the Government Department or corporate enterprise or institution concerned, to possess an educational qualification which is recognised to be of "national higher educational" standard.

A "Professional Occupation" may be defined as any occupation, in respect of which the possession of an educational qualification which is recognised to be of "national higher educational" standard is prescribed by or under any law as a necessary qualification for any person who is gainfully employed in such occupation.

(2) "Sub-professional manpower", "sub-professiona post" and "sub-professional occupation" may be defined in the same terms as "professional manpower", professional post" and "professional occupation", respectively, subject to the substitution of the expression "regional higher educational" for "national higher educational".

196. It should be the undivided responsibility of the Union Manpower Authority to organize the planned development of the entire national stock of professional manpower and to regulate its employment throughout the country.

Subject to coordination by the Union Manpower Authority so as to secure All-India requirements, it should be the responsibility of every State Manpower Authority to organize the planned development of the State component of the national stock of sub-professional manpower and to regulate its employment in the State.

In respect of higher educated manpower in the States (other than professional manpower and sub-professional manpower) undivided responsibility for performing such functions as may be required in terms of All-India policy should vest exclusively in the State Manpower Authorities.

The Union Manpower Authority as well as every State Manpower Authority should be vested by Act of Parliament with such powers as may be necessary for the performance of the functions as thus specified.

APPENDIX I

AN EXPLANATORY NOTE ON ENROLMENT STATISTICS INCLUDED IN THE REPORT

(Prepared by **Shri D. L. Sharma** under the guidance of the **Member-Secretary**)

1. The object of this Note is to explain the basis of compilation for the enrolment statistics included in this Report.

2. The organization of the educational system, as visualised by the Education Commission, has been explained in detail in Chapter II. The manner in which the existing structure in the different States at the school stage is equated with this proposed structure, is shown below:

EQUIVALENCE OF CLASSES I-X AT THE SCHOOL STAGE (1965-66)

As proposed by the Education Commission	*Group A*	*Group B*	*Group C*
X	X	XI	X
IX	IX	X	IX
VIII	VIII	IX	VIII
VII	VII	VIII	VII
VI	VI	VII	VI
V	V	VI	V
IV	IV	V	IV
III	III	IV	III
II	II	III	II
I	I	II	I
Pre-Primary Education	B	I	
	A		
	Assam Nagaland NEFA	Andhra Pradesh Bihar Gujarat Madras Maharashtra Orissa Dadra & Nagar Haveli Goa, Daman and Diu Pondicherry	Jammu & Kashmir Kerala Madhya Pradesh Mysore Punjab Rajasthan Uttar Pradesh West Bengal A & N Islands Delhi Himachal Pradesh L.M.A. Islands Manipur Tripura

Explanatory Note. (i) The chart given above shows the position in 1965-66. It has varied from time to time. In tabulating enrolment, the position as it was in the year concerned, has been adopted.

(ii) There is no public examination at the end of Class X in Madhya Pradesh, Delhi and A & N Islands. But the higher secondary examination in these areas, which is held at the end of Class XI, leads to the three-year degree course. We have, therefore, equated Class X in these areas with the class leading to the high school examination in other States.

3. In the school stage ending with the high school, the total duration of schooling is 12 years in one group of States and Union Territories, 11 years in another group, and 10 years in the third group.

4. The central point in this proposal is to treat the public examination at the end of the High School stage (which is Class X in some States and Class XI in others) as equivalent and to go downwards, equating each successive class in school education and also upwards, equating each successive year in higher education.

In the enrolment statistics given in the Report, the equation of school classes is as follows:

Class in the Commission's Report	Equated with
Pre-Primary Stage	Infant A and B in Group A, Class I in Group B and Pre-Primary (not shown in the chart) in 1 States.
Class	
I	~~Class I in Groups A & C and Class II in Group B,~~
II	Class II in Groups A & C and Class III in Group B, and so on,
X	Class X in Groups A & C, and Class XI in Group B.

5. The equivalence in higher education courses (arts and science) has been shown in the chart given below.

EQUIVALENCE IN HIGHER EDUCATION

(1965-66)

First Degree	III	III	A	III	III	III
	II	II	II	II	II	II
	I	I	I	I	I	I
Higher Secondary	XII	II	XII	A	A	A
	XI	I	XI	XI	XI/XII/ PUC	PUC
	As proposed by the Education Commission	Kerala (The first two years belong to Junior Colleges)	U.P.	Madhya Pradesh A & N Islands Delhi	Andhra Pradesh Assam Bihar Jammu & Kashmir Maharashtra Mysore Punjab Rajasthan West Bengal Himachal Pradesh Manipur NEFA Tripura	Gujarat Madras Nagaland Orissa Goa, Daman, and Diu Pondicherry

Explanatory Note

(i) Columns marked 'A' show the year to be added by 1986.

(ii) The chart given above shows the position in 1965-66. It has varied from time to time. In tabulating enrolment, the position as it was in the year concerned has been adopted.

(iii) PUC=Pre-University Course.

6. *Pre-Primary Education.* In our statistics, pre-primary education includes enrolments in the following three categories:

(1) Pre-Primary classes proper
(2) Infant A Class
(3) Infant B Class and Class I (where it corresponds to the Infant B Class).

In each year of tabulation the corresponding enrolments in all the States and Union Territories which had the categories mentioned above have been aggregated together and given in Table 1.

7. *General School Education* (Classes I—X). Enrolment in Classes I—X as aggegated by us, includes Classes II—XI in those States where the school stage is spread over 11 years and Classes I—X in all the other States. The retabulated enrolments are given below in Table 2.

TABLE 1. ENROLMENT IN PRE-PRIMARY EDUCATION (1950-51 To 1965-66)

(In thousands)

Class	1950-51			1955-56			1960-61			1965-66 (Estimated)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Pre-Primary	15	13	28	45	31	75	97	82	179	130	120	250
Infant A .	687	221	908	445	224	668	352	227	579	453	300	753
Infant B and Class I	2,675	1,566	4,241	4,108	2,283	6,391	4,932	2,922	7,855	6,563	4,207	10,770
TOTAL .	3,377	1,800	5,177	4,598	2,537	7,135	5,381	3,231	8,612	7,146	4,627	11,773

Source. Ministry of Education, Form A of the States concerned till 1960-61. The figures for 1965-66 were estimated in the Secretariat of the Commission.

N. B. Totals do not tally because of rounding.

TABLE 2. ENROLMENT IN CLASSES I-X (1950-51) To (1965-66)

(In thousands)

Class	1950-51			1955-56			1960-61			1965-66 (Fstimated)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
I .	3,750	1,466	5,216	4,808	2,137	6,945	6,401	3,127	9,528	9,057	4,827	13,884
II .	2,664	939	3,603	3,149	1,295	4,443	4,383	2,026	6,409	6,246	3,210	9,456
III .	2,101	686	2,788	2,450	934	3,384	3,534	1,538	5,073	4,888	2,546	7,434
IV .	1,587	458	2,045	1,963	645	2,608	2,852	1,135	3,987	4,345	1,971	6,316
Total of classes I-IV	10,102	3,549	13,651	12,369	5,011	17,380	17,170	7,826	24,996	24,536	12,554	37,090
V .	1,111	244	1,355	1,470	398	1,867	2,276	814	3,090	3,666	1,550	5,216
VI .	873	184	1,056	1,215	304	1,519	1,819	601	2,421	2,897	1,151	4,048
VII .	686	131	816	975	232	1,206	1,491	461	1,952	2,399	886	3,285
Total of classes V-VII .	2,669	559	3,228	3,659	933	4,592	5,587	1,876	7,463	8,962	3,587	12,549
VIII .	581	91	672	790	163	953	1,191	320	1,511	1,856	620	2,476
IX .	378	54	433	630	120	751	920	220	1,140	1,494	421	1,915
X .	315	41	356	505	91	596	764	166	930	1,267	332	1,599
Total of Classes VIII-X .	1,275	186	1,461	1,926	374	2,300	2,876	706	3,582	4,617	1,373	5,990
GRAND TOTAL .	14,046	4,293	18,339	17,954	6,318	24,272	25,633	10,408	36,041	38,115	17,514	55,629

Source. Ministry of Education, Form A of the States concerned till 1960-61. The figures for 1965-66 were estimated in the Secretariat of the Commission.

N. B. Totals do not tally because of rounding.

9. *Basis of Estimating Enrolments at the School Stage in 1965-66.* The total enrolments at the school stage for 1965-66 were assumed to be the same as given by the Planning Commission. In breaking down these enrolments class by class, however, it was assumed that owing to the reduction of wastage and the increasing desire to stay longer at school the proportion of the enrolment in higher classes to the total enrolment at the school stage will be a little better in 1965-66 than in 1960-61. Table 3 shows the actual proportion of the enrolments in each class to the total enrolment at the school stage for the years 1950-51, 1955-56 and 1960-61 (on the new pattern of aggregation adopted by us). It also gives the assumptions made by us regarding this proportion for 1965-66.

TABLE 3. PROPORTION OF ENROLMENT IN EACH CLASS AT THE SCHOOL STAGE TO TOTAL ENROLMENT

Class	1950-51		1955-56		1960-61		1965-66 (estimated)	
	Boys %	Girls %	Boys %	Girls %	Boys %	Girls %	Boys %	Girls %
Pre-Primary	0·1	0·2	0·2	0·4	0·3	0·6	0·3	0·6
A	3·9	3·6	2·0	2·5	1·1	1·7	1·0	1·3
B	15·4	25·7	18·2	25·8	15·9	21·4	14·5	19·0
I	21·5	24·1	21·3	24·1	20·6	22·9	20·0	21·8
II	15·3	15·4	14·0	14·6	14·1	14·9	13·8	14·5
III	12·1	11·3	10·9	10·5	11·4	11·3	10·8	11·5
IV	9·1	7·5	8·7	7·3	9·2	8·3	9·6	8·9
V	6·4	4·0	6·5	4·5	7·3	6·0	8·1	7·0
VI	5·0	3·0	5·4	3·4	5·9	4·4	6·4	5·2
VII	3·9	2·1	4·3	2·6	4·8	3·4	5·3	4·0
VIII	3·3	1·5	3·5	1·8	3·8	2·3	4·1	2·8
IX	2·2	0·9	2·8	1·4	3·0	1·6	3·3	1·9
X	1·8	0·7	2·2	1·0	2·5	1·2	2·8	1·5
TOTAL	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

Source. Ministry of Education, Form A of the States till 1960-61. The figures for 1965-66 were estimated in the Secretariat of the Commission.

10. *General School Education (Classes XI and XII.* In tabulating enrolements in general school education in Classes XI and XII, the enrolments in the following categories were included:

(i) Class XI of the Higher Secondary Schools in all the States which have adopted the higher secondary pattern.

(ii) The pre-university class.

(iii) Intermediate classes (1st and 2nd year) in U.P. except the second year in the Universities of Aligarh and Banaras which have adopted the three-year degree course.

(iv) The first year of the Intermediate class in all the other States which have now adopted the three-year degree course (the second year, where it existed, has been shown in the undergraduate stage).

In short, we have shown the first year of the Intermediate class as a part of Classes XI and XII in all cases. Where the three-year degree course has been adopted, the second year has been shown in the undergraduate stage. Where the three-year degree course has not been adopted, both the years have been shown under classes XI and XII, the only exception to this being the City of Bombay for which no separate figures are available.

The Intermediate (Commerce) classes have been regarded as part of general education and the corresponding enrolment has been shown under Classes XI and XII.

The retabulated enrolments on these assumptions have been given in Table 4.

11. *General Education (Undergraduate Stage).* In our retabulation, the enrolments in general education at the undergraduate stage include the following:

(i) Enrolments in the second year of the Intermediate classes in all States which have now adopted the Three-Year Degree Course.

(ii) Enrolments in the First Degree Courses for Arts and Science.

(iii) Enrolments in the First Degree Courses for Commerce.

12. *General Education (Postgraduate and Research).* There are no difficulties about the enrolments in general education at the postgraduate stage and research. These have been taken from the publications of the Ministry of Education and are given in Table 5 along with the enrolments at undergraduate stage.

13. *Vocational Schools.* The enrolment in vocational schools is of a mixed character. In some courses such as polytechnics, admission is given only to those who have completed the secondary school. In other courses such as teacher-training or in industrial training institutes, admission is given to those who have completed the secondary school as well as to those who have completed the primary school only. In some other courses such as arts and crafts (*e.g.* tailoring) the admission is mostly of those who have not completed the secondary school, although there are a few students who have done so. It is, therefore, necessary to make certain assumptions regarding the enrolment of students who have completed the secondary school and of those who have completed the primary school only. We make the following assumptions:

(i) *Teacher Training.* 20 per cent of the enrolment was regarded as *not* having completed the secondary school.

(ii) *Arts and Crafts.* All the enrolment was regarded as *not* having completed the secondary school.

In all other vocational courses, such as engineering and technology, medicine and veterinary science, agriculture and forestry, commerce, physical education, library science, co-operation, marine training, etc., the enrolment was regarded as being of the higher secondary stage or equivalent to Classes XI to XII. We realise that there is a small proportion of students in agricultural and medical schools who have not completed the secondary school. But we have assumed that this will be off-set by the enrolment of students who have completed the secondary school and joined courses of arts and crafts.

14. The enrolments in vocational courses retabulated on these bases are given in Table 6.

15. *Professional Education at the University Stage.* In professional education at the university stage, we divided the enrolments into three parts:

(i) Enrolments corresponding to the higher secondary stage or Classes XI and XII;

(ii) Enrolments for the first degree or the undergraduate stage; and

(iii) Enrolments for the second degree or the postgraduate stage.

Enrolments corresponding to those at the higher secondary stage (Classes XI and XII).

In the statistics of enrolments in training colleges, the enrolments of graduates preparing for the B.T. or B.Ed. degree are mixed up with those of matriculates undergoing a one or two year course. The enrolments in the B.T. or B.Ed. class are also separately available in the publication, *Education in Universities* issued by the Ministry of Education. Deducting these, after making adjustments for certain relevant factors, we estimated the enrolments of students in the training colleges who have completed the secondary school stage only. These have been shown as belonging to the higher secondary stage.

Similarly the enrolments for Intermediate Science (Agriculture) have been estimated and shown as vocational education at the school stage corresponding to Classes XI and XII.

In the same way we have estimated the enrolments in Intermediate (commerce) and as pointed out earlier these have been shown under general education at the higher secondary stage.

All the remaining enrolments in the professional courses in higher education were divided into two categories: enrolments at the first degree stage (or undergraduate) and enrolments at the second and research degrees (or postgraduate).

16. The retabulated enrolments on the above assumptions have been shown in Table 7.

17. *Total Enrolments.* The total enrolments in the educational system as a whole, re-tabulated on the lines indicated above, are given in Table 8. In this context the following points may be noted:

(i) Enrolments in vocational education corresponding to the lower secondary stage (Classes VIII—X) have been taken from the school portion in Table 6.

(ii) Enrolments in vocational education corresponding to the higher secondary stage (Classes XI—XII) have been taken from Tables 6 and 7.

(iii) No attempt has been made to re-tabulate the enrolments in special schools and colleges. These have been reproduced from the publications of the Ministry of Education.

18. *Enrolment Statistics Published by the Ministry of Education.* The enrolment statistics published by the Ministry of Education adopt a different system of equivalence at the school stage. They start by equating the lowest classes with one another, *i.e.* Infant 'A' in Assam, Class I in a State like Maharashtra with 11 year school system and also Class I in a State like Uttar Pradesh with a 10-year school system are all equated together. The equivalence proceeds upwards class by class. In this method, the main weakness is that classes which are quite unlike to each other are added together. For example, Class X of Uttar Pradesh which is matriculation class is added to Class X of Bihar which is pre-matriculation class or Class XI of Delhi which is the higher secondary class is added to Class XI of Maharashtra which is the matriculation class.

The enrolments according to this system have been given in Table 9 for purposes of comparison. It will be seen that the totals of enrolments in Tables 8 and 9 tally. But the enrolments at sub-stages do not tally for reasons already explained.

TABLE 4. ENROLMENT IN GENERAL SCHOOL EDUCATION CLASSES XI AND XII (1950-51 TO 1965-66)

Type of Course	1950-51			1955-56			1960-61			1965-66 (Estimated)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Classes XI and XII												
General Education	121,693	17,193	138,886	223,388	35,655	259,043	384,964	72,353	457,317	638,690	138,320	777,010
Intermediate (Commerce)	18,554	58	18,612	28,242	242	28,484	33,303	405	33,708	56,745	700	57,445
TOTAL	140,247	17,251	157,498	251,630	35,897	287,527	418,267	72,758	491,025	695,435	139,020	834,455

Source. Ministry of Education, Form A of the States concerned.

TABLE 5. ENROLMENT IN GENERAL EDUCATION AT THE UNDERGRADUATE AND POSTGRADUATE STAGES (1950-51 TO 1965-66)

Type of Course	1950-51			1955-56			1960-61			1965-66 (Estimated)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
1. Undergraduate Courses in Arts & Science	153,151	22,029	175,180	248,571	45,961	294,532	313,385	82,483	395,868	549,510	147,480	696,990
2 Undergraduate Courses in Commerce	15,579	104	15,683	27,254	162	27,416	37,919	416	38,335	61,455	800	62,255
TOTAL (UNDERGRADUATE)	168,730	22,133	190,863	275,825	46,123	321,948	351,304	82,899	434,203	610,965	148,280	759,245
3. *Postgraduate*												
M.A. & M.Sc.	14,401	2,127	16,528	21,293	4,040	25,333	37,541	9,298	46,839	62,350	15,910	78,269
Research	1,051	139	1,190	2,193	371	2,564	3,576	697	4,273	6,450	1,290	7,740
TOTAL (POSTGRADUATE AND RESEARCH)	15,452	2,266	17,718	23,486	4,411	27,897	41,117	9,995	51,112	68,800	17,200	86,000

Source. Ministry of Education, Form A of the States concerned.

TABLE 6. ENROLMENT IN VOCATIONAL SCHOOLS/COURSES (1950-51 TO 1965-66)

Type of Course	1950-51			1955-56			1960-61			1965-66 (Estimated)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
***Lower Secondary Stage* (*Classes VIII—X*)**												
1. Teacher Training . .	10,414	3,599	14,013	13,007	5,176	18,183	18,226	6,310	24,536	..	..	..
2. Arts & Crafts etc. . .	18,185	14,156	32,341	25,553	26,669	52,222	46,584	29,110	75,694	..	..	..
TOTAL .	28,599	17,755	46,354	38,560	31,845	70,405	64,810	35,420	100,230	90,100	46,800	136,900
Higher Secondary Stage (Classes XI—XII)												
1. Teacher Training . .	41,655	14,395	56,050	52,026	20,705	72,731	72,904	25,242	98,146	..	..	..
2. Engineering and Technology	20,811	337	21,148	41,181	214	41,395	85,864	438	86,302	..	..	..
3. Medicine and Veterinary Science	3,221	1,452	4,673	4,308	2,565	6,873	5,332	6,536	11,868	..	..	..
4. Agriculture and Forestry .	1,872	9	1,881	5,332	14	5,346	7,832	74	7,906	..	..	..
5. Commerce . . .	34,206	3,280	37,486	69,241	10,326	79,567	95,790	17,034	112,824	..	..	..
6. Physical Education* .	1,000	300	1,300	1,871	372	2,243	2,929	515	3,444	..	..	..
7. Library Science . .	..	..	..	..	..	..	50	..	50	..	..	..
8. Co-operation .	..	..	..	..	..	..	1,656	15	1,671	..	..	..
9. Marine Training .	116	..	116	1,206	..	1,206	1,561	..	1,561	..	..	..
10. Other Subjects . .	..	..	..	354	..	354	770	275	1,045	..	..	..
TOTAL .	102,881	19,773	122,654	175,519	34,196	209,715	274,688	50,129	324,817	439,900	73,200	513,100
GRAND TOTAL .	131,480	37,528	169,008	214,079	66,041	280,120	339,498	85,549	425,047	530,000	120,000	650,000

***Source*:** Ministry of Education, Form A.

*We have ignored, for 1950-51, the enrolment in Akharas because this enumeration was later on discontinued.

TABLE 7. ENROLMENT IN PROFESSIONAL COURSES (1950-51 TO 1965-66)

Type of Course	1950-51			1955-56			1960-61			1965-66 (Estimated)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Agriculture												
Higher Secondary Stage .	1,630	2	1,632	2,359	16	2,375	6,717	74	6,791	11,600	200	11,800
Undergraduate Stage .	2,579	20	2,599	3,000	15	3,015	8,627	65	8,692	14,750	150	14,900
Postgraduate & Research .	400	2	402	481	6	487	355	10	365	3,280	20	3,300
TOTAL .	4,609	24	4,633	5,840	37	5,877	15,699	149	15,848	29,630	370	30,000
Commerce												
Higher Secondary Stage .	18,554	58	18,612	28,242	242	28,484	33,303	405	33,708	56,745	700	57,445
Undergraduate Stage .	15,579	104	15,683	27,254	162	27,416	37,919	416	38,335	61,455	800	62,255
Postgraduate & Research .	2,047	5	2,052	3,000	18	3,018	6,226	43	6,269	9,440	60	9,500
TOTAL .	36,180	167	36,347	58,496	422	58,918	77,448	864	78,312	127.640	1,560	129,200
Teacher Training												
Higher Secondary Stage .	180	150	330	1,112	890	2,002	17,656	9,032	26,688	25,415	13,685	39,100
Undergraduate Stage .	3,399	1,486	4,885	8,500	3,288	11,788	13,500	6,000	19,500	21,500	10,500	32,000
Postgraduate & Research .	260	110	370	350	140	490	450	170	620	600	300	900
TOTAL .	3,839	1,746	5,585	9,962	4,318	14,280	31,606	15,202	46,808	47,515	24.485	72,000

Source : Ministry of Education Form A till 1960-61. For 1965-66 figures have been estimated in the Secretariat of the Education Commission.

TABLE 7. ENROLMENT IN PROFESSIONAL COURSES (1950-51 TO 1965-66) (*Contd.*)

Type of Course	1950-51			1955-56			1960-61			1965-66 (Estimated)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Engineering and Technology												
Undergraduate Stage	12,968	37	13,005	19,311	34	19,345	46,719	372	47,091	..	..	78,000
Postgraduate and Research	260	3	263	509	4	513	745	2	747	..	..	2,000
TOTAL	13,228	40	13,268	19,820	38	19,858	47,464	374	47,838	..	..	80,000
Law												
Undergraduate Stage	12,936	287	13,223	19,349	331	19,680	25,400	769	26,169	30,662	1,038	31,700
Postgraduate and Research	207	4	211	572	16	588	936	36	972	1,250	50	1,300
TOTAL	13,143	291	13,434	19,921	347	20,268	26,336	805	27,141	31,912	1,088	33,000
Medicine												
Undergraduate Stage	11,930	2,231	14,161	19,721	3,719	23,440	29,264	7,638	36,902	..	..	60,500
Postgraduate and Research	690	110	800	1,364	268	1,632	2,900	600	3,500	..	..	4,500
TOTAL	12,620	2,341	14,961	21,085	3,987	25,072	32,164	8,238	40,402	..	..	65,000
Veterinary Science												
Undergraduate Stage	1,290	6	1,296	3,536	13	3,549	5,328	45	5,373	..	..	6,250
Postgraduate and Research	50	..	50	100	..	100	170	2	172	..	..	250
TOTAL	1,340	6	1,346	3,636	13	3,649	5,498	47	5,545	..	..	6,500

TABLE 7. ENROLMENT IN PROFESSIONAL COURSES (1950-51 TO 1965-66) (*Concld.*)

Type of Course	1950-51			1955-56			1960-61			1965-66 (Estimated)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Forestry												
Undergraduate Stage . .	243	..	243	250	..	250	558	..	558	600	..	600
Postgraduate and Research	70	..	70	70	..	70	125	..	125	200	..	200
TOTAL .	313	..	313	320	..	320	683	..	683	800	..	800
Others												
Undergraduate Stage .	323	53	376	656	51	707	1,944	410	2,354	..	..	3,250
graduate and Research	..	..	..	40	5	45	145	35	180	..	..	250
TOTAL .	323	53	376	696	56	752	2,089	445	2,534	..	..	3,500
Grand Total												
Higher Secondary Stage .	20,364	210	20,574	31,713	1,148	32,861	57,676	9,511	67,187	93,760	14,585	108,345
Undergraduate Stage .	61,247	4,224	65,471	101,577	7,613	109,190	169,259	15,715	184,974	256,040	33,415	289,455
Postgraduate and Research	3,984	234	4,218	6,486	457	6,943	12,052	898	12,950	20,200	2,000	22,200
TOTAL OF ALL STAGES .	85,595	4,668	90,263	139,776	9,218	148,994	238,987	26,124	265,111	370,000	50,000	420,000

Source. Ministry of Education, Form A, except for 1965-66 which have been estimated in the Secretariat of the Commission.

Note. For net enrolments in professional education, the enrolments in I. Com. and B. Com. which are included in the above figures should be excluded.

TABLE 8. TOTAL ENROLMENT IN THE EDUCATIONAL SYSTEM (RETABULATED ON THE NEW PATTERN) (1950-51 TO 1965-66)

(In thousands)

Stage of Education	1950-51			1955-56			1960-61			1965-66 (Estimated)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
General Education												
1. Pre-Primary	3,377	1,800	5,177	4,598	2,537	7,135	5,381	3,231	8,612	7,146	4,627	11,773
2. Lower Primary (Classes I to IV)	10,102	3,549	13,651	12,369	5,011	17,380	17.170	7,826	24,996	24,536	12.554	37,090
3. Higher Primary (Classes V to VII)	2.669	559	3.228	3.659	933	4.593	5.587	1.876	7,463	8,962	3,587	12,549
4. Lower Secondary (Classes VIII to X)	1,275	186	1,461	1.926	374	2.300	2.876	706	3,582	4,617	1,373	5,990
5. Higher Secondary (Classes XI to XII)	140	17	157	252	36	288	418	73	491	695	139	834
6. Undergraduate	169	22	191	276	46	322	351	83	434	611	148	759
7. Postgraduate and Research	15	2	18	23	4	28	41	10	51	69	17	86
Vocational Education												
8. At the Lower Secondary Stage	29	18	46	39	32	70	65	35	100	90	47	137
9. At the Higher Secondary Stage	105	20	125	179	35	214	299	59	358	477	87	564
10. Professional Education (First Degree)	46	4	50	74	7	82	131	15	147	195	33	227
11. Professional Education (Postgraduate & Research)	4	..	4	6	1	7	12	1	13	20	2	22
Special Education												
12. Special Schools	132	18	150	182	33	215	162	36	197	185	40	225
13. Special Colleges	6	2	7	9	3	12	15	7	22	23	12	35
TOTAL	18,068	6,197	24,265	23,592	9,053	32,645	32,508	13,959	46,467	47,626	22,666	70,292

Note. Totals do not tally because of rounding.

TABLE 9. ENROLMENT IN EDUCATION ON THE EXISTING PATTERN (1950-51 TO 1965-66)

(In thousands)

Stage of Education	1950-51			1955-56			1960-61			1965-66 (Estimated)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
General Education												
Pre-Primary	15	13	28	45	31	75	97	82	179	130	120	250
Lower Primary (Classes I—IV)	12,294	4,961	17,256	15,706	7,058	22,764	21,002	10,380	31,383	29,185	16,430	45,615
Higher Primary (Classes V—VII)	3,338	829	4,167	4,308	1,229	5,536	6,299	2,259	8,558	9,789	3,866	13,615
Lower Secondary (Classes VIII—X)	1,551	259	1,809	2,204	474	2,677	3,250	841	4,091	5,294	1,562	6,856
Higher Secondary (Classes XI—XII)	230	33	263	294	66	360	447	92	539	991	195	1,186
Pre-University/ Intermediate@	195	26	221	342	55	396	381	77	458	621	136	757
Undergraduate	75	12	87	126	25	151	236	64	299	439	118	557
Postgraduate & Research	15	2	18	23	4	28	41	10	51	69	17	86
Vocational Education (School Standard)	149	41	191	214	66	280	339	86	425	530	120	650
Professional Education (College Standard)	86	5	90	140	9	149	239	26	265	370	50	420
Special Education (School Standard)	132	18	150	182	33	215	162	36	197	185	40	225
Special Education (College Standard)	6	2	7	9	3	12	15	7	22	23	12	35
TOTAL	*18,086	*6,201	*24,287	23,592	9,053	32,645	**32,508	**13,959	**46,467	47,626	22,666	70,292

@ Includes enrolment in Classes XI and XII in U.P.

*Includes 17,965 boys and 3,595 girls in Akharas (Vocational education school standard). These have been excluded in the revised consolidation.

**Excludes 6,197 boys and 852 girls in NEFA and includes 2,842 boys and 1,485 girls in unrecognised institutions in Nagaland whose class-wise distribution is not available.

Note. Totals do not tally because of rounding.

APPENDIX II

RESOLUTION OF THE GOVERNMENT OF INDIA SETTING UP THE EDUCATION COMMISSION[1]

The Government of India, ever since the attainment of independence, have given considerable attention to the development of a national system of education rooted in the basic values and the cherished traditions of the Indian nation and suited to the needs and aspirations of a modern society. While some advances have been made in these directions, the educational system has not generally evolved in accordance with the needs of the times, and a wide and distressing gulf continues to persist between thought and action in several sectors of this crucial field of national activity. In view of the important role of education in the economic and social development of the country, in the building of a truly democratic society, in the promotion of national integration and unity, and above all, for the transformation of the individual in the endless pursuit of excellence and perfection, it is now considered imperative to survey and examine the entire field of education in order to realize within the shortest possible period a well-balanced, integrated and adequate system of national education capable of making a powerful contribution to all spheres of national life.

(2) The attainment of independence ushered in a new era of national development founded upon: the adoption of a secular democracy, not only as a form of government but also as a way of life; the determination to eliminate the poverty of the people and to ensure a reasonable standard of living for all, through modernization of agriculture and rapid development of industry; the adoption of modern science and technology and their harmonizing with traditional spiritual values; the acceptance of a socialistic pattern of society which will secure equitable distribution of wealth and equality of opportunity for all in education, employment and cultural advancement. Greater emphasis came to be placed on educational development because of the realization that education, especially in science and technology, is the most powerful instrument of social transformation and economic progress and that the attempt to create a new social order based on freedom, equality and justice can only succeed if the traditional educational system was revolutionized, both in content and extent.

(3) Quantitatively, education at all levels has shown a phenomenal development in the post-independence period. In spite of this expansion, however, there is widespread dissatisfaction about several aspects of educational development. For instance, it has not yet been possible to provide free and universal education for all children up to 14 years of age. The problem of mass illiteracy continues to be immense. It has not been possible to raise standards adequately at the secondary and university stages. The diversification of curricula in secondary and higher education has not kept pace with the times so that the problem of educated unemployment has been intensified on the one hand while, on the other, there is an equally acute shortage of trained manpower in several sectors. The remuneration and service conditions of teachers leave a great deal to be desired; and several important academic problems are still matters of intense controversies. In short, qualitative improvements in education have not kept pace with quantitative expansion, and national policies and programmes concerning the quality of education, even when these were well-conceived and generally agreed to, could not be implemented satisfactorily.

(4) The Government of India are convinced that education is the key to national prosperity and welfare and that no investment is likely to yield greater returns than investment in human resources of which the most important component is education. Government have also decided to mobilize all the resources of science and technology which can only be done on the foundation of good and progressive education and, to that end, to increase considerably their total investment in the development of education and scientific research. The nation must be prepared to pay for quality in education, and from the value attached to education by all sectors of the people it is clear that they will do so willingly.

(5) It is desirable to survey the entire field of educational development as the various parts of the educational system strongly interact with and influence one another. It is not possible to have progressive and strong universities without efficient secondary schools and the quality of these schools is determined by the functioning of elementary schools. What is needed, therefore, is a synoptic survey and an imaginative look at education considered as a whole and not fragmented into parts and stages. In the past, several commissions and committees have examined limited sectors and specific aspects of education. It is now proposed to have a comprehensive review of the entire educational system.

(6) While the planning of education for India must necessarily emanate from Indian experience and conditions. Government of India are of the opinion that it would be advantageous to draw upon the experience and thinking of educationists and scientists from other parts of the world in the common enterprise of seeking for the right type of education which is the quest of all mankind, specially at this time when the world is becoming closely knit together in so many ways. It has, therefore, been decided to associate with the Commission, either as members or as consultants, some eminent scientists and educationists from other countries. The United Nations' Educational, Scientific and Cultural Organization has provided three members

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1. No. F.41/3(3)/64-E.I. Ministry of Education, Government of India, New Delhi, the 14th of July 1964 as finally modified.

for the Commission, *viz.*, Mr. Jean Thomas, Inspector General of Education, France, and formerly Assistant Director General of UNESCO, Prof. Shumovsky, Director, Methodological Division, Ministry of Higher and Special Secondary Education, RSFSR, Moscow, and Professor of Physics, Moscow University, and Prof. Sadatoshi Ihara, Professor of the First Faculty of Science and Technology, Waseda University, Tokyo; who have since joined the Commission. It is expected that the collaboration of some eminent scientists and educationists, as consultants, with the work of the Commission, will also be forthcoming. Negotiations are in progress with some more specialists and additions of names of foreign consultants will be notified from time to time. In addition, the Commission has been authorized to invite from time to time such other consultants in India in relation to any aspect of its enquiry as it may consider necessary.

(7) For the purposes outlined in the foregoing paragraphs, Government of India have decided to set up an Education Commission consisting of the following members:

Chairman

1. Prof. D. S. Kothari, Chairman, University Grants Commission, New Delhi.

Members

2. Shri A. R. Dawood, Former Director, Extension Programmes for Secondary Education, New Delhi.
3. Mr. H. L. Elvin, Director, Institute of Education, University of London, London.
4. Shri R. A. Gopalaswami, Director, Institute of Applied Manpower Research, New Delhi.
5. Dr. V. S. Jha, Former Director of the Commonwealth Education Liaison Unit in London.
6. Shri P. N. Kirpal, Educational Adviser to the Government of India, New Delhi.
7. Prof. M. V. Mathur, Professor of Economics and Public Administration, University of Rajasthan, Jaipur.
8. Dr. B. P. Pal, Director, Indian Agricultural Research Institute, New Delhi.
9. Kumari S. Panandikar, Head of the Department of Education, Karnatak University, Dharwar.
10. Prof. Roger Revelle, Dean of Research, University of California, U.S.A.
11. Dr. K. G. Saiyidain, former Educational Adviser to the Government of India, New Delhi.
12. Dr. T. Sen, Rector, Jadavpur University, Calcutta.
13. Mr. Jean Thomas, Inspector General of Education, France, and formerly Assistant Director-General of UNESCO.
14. Prof. S. A. Shumovsky, Director, Methodological Division, Ministry of Higher and Special Secondary Education, RSFSR, Moscow, and Professor of Physics, Moscow University.
15. Prof. Sadatoshi Ihara, Professor of the First Faculty of Science & Technology, Waseda University, Tokyo.

Member-Secretary

16. Shri J. P. Naik, Head of the Department of Educational Planning, Administration & Finance, Gokhale Institute of Politics & Economics, Poona.

Associate Secretary

17. Mr. J. F. McDougall, Assistant Director, Department of School and Higher Education, UNESCO, Paris.

(8) The Commission will advise Government on the national pattern of education and on the general principles and policies for the development of education at all stages and in all its aspects. It need not, however, examine the problems of medical or legal education, but such aspects of these problems as are necessary for its comprehensive enquiry may be looked into.

(9) The Commission will submit its final report as early as possible and not later than the 31st March, 1966. Where immediate implementation of certain programmes is necessary the Commission may also submit, from time to time, interim repots dealing with limited sectors on problems of education. Government are anxious that the implementation of agreed recommendations about specific matters of importance shall on no account be held up until the completion of the Commission's work. On the other hand its expert advice and guidance should be continuously available to those charged with the responsibility for implementing educational programmes and policies.

Ordered that a copy of the Resolution be communicated to all State Governments and Administrations of Union Territories and to all Ministries of the Government of India.

Ordered also that the Resolution be published in the Gazette of India for information.

PREM KIRPAL,
Secretary
to the Government of India.

APPENDIX III

CONSULTANTS TO THE EDUCATION COMMISSION

1. Dr. James E. Allen, Jr., Commissioner, State Education Department, and President, University of the State of New York, New York, USA.
2. Dr. C.E. Beeby, Visiting Professor, Centre for Studies in Education and Development, Graduate School of Education, Harvard University, Cambridge, Massachusetts, USA.
3. Prof. P.M.S. Blackett, President of the Royal Society, UK, Professor of Physics, Imperial College of Science and Technology, University of London, London.
4. Recteur J.J. Capelle, Professor, University of Nancy, and former Director-General of Education in France, Paris.
5. Sir Christopher Cox, Educational Adviser, Ministry of Overseas Development, UK, and Fellow, New College, Oxford.
6. Dr. Philip H. Coombs, Director, UNESCO International Institute for Educational Planning, Paris.
7. Prof. Andre Daniere, Centre for Studies in Education and Development, Graduate School of Education, Harvard University, Cambridge, Massachusetts, USA.
8. Prof. S. Dedijer, Institute of Sociology, University of Lund, Sweden.
9. Dr. Nicholas DeWitt, Director, International Survey of Educational Development and Planning, Indiana University, Bloomington, Indiana, USA.
10. Dr. John Guy Fowlkes, School of Education, University of Wisconsin, Madison, USA.
11. Sir Willis Jackson, Head of the Department and Professor of Electrical Engineering, Imperial College of Science & Technology, University of London, London.
12. Dr. J. Paul Leonard, Professor of Education, Columbia University, Teachers' College, and Chief of Party, Columbia University Team in India, New Delhi.
13. Dr. Gordon N. Mackenzie, Professor of Education, Teachers' College, Columbia University, New York, USA.
14. Professor C.A. Moser, Director, Unit for Economic and Statistical Studies on Higher Education, London School of Economics and Political Science, London.
15. Prof. S. Okita, Executive Director, Japan Economic Research Centre, Tokyo, and Special Adviser to the Minister of Economic Planning Agency, Government of Japan.
16. Professor A.R. Prest, Professor of Economics and Public Finance, University of Manchester, Manchester, England.
17. Lord Robbins, Professor Emeritus, London School of Economics, and Chairman of *Financial Times*, London. Recently Chairman of the Committee on Higher Education, UK.
18. Professor Edward A. Shils, Professor of Sociology and Social Thought in the Committee on Social Thought, University of Chicago, USA., and Fellow of King's College, Cambridge, UK.
19. Dr. Frederick Seitz, President, National Academy of Sciences, Washington, USA.
20. Professor W.C. Smith, Professor of World Religions and Director, Centre for the Study of World Religions, Harvard University, Cambridge, Massachusetts, USA.

APPENDIX IV

TASK FORCES AND WORKING GROUPS

I. TASK FORCE ON ADULT EDUCATION

1. Dr. V. S. Jha, Member, Education Commission, New Delhi. *Convener*
2. Shri Abdul Qadir, Director-General of Employment & Training, Ministry of Labour & Employment, New Delhi.
3. Shri G.K. Chandiramani, Additional Secretary, Ministry of Education, New Delhi.
4. Shri A.R. Deshpande, Adviser (Social Education), Ministry of Education, New Delhi.
5. Shrimati Durgabai Deshmukh, Vice-Chancellor's Residence, Delhi University, Delhi.
6. Mrs Welthy Fisher, Literacy House, Kanpur Road, Lucknow.
7. Shri K. L. Joshi, Secretary, University Grants Commission, New Delhi.
8. Shri D. R. Kalia, Director, Delhi Public Library, Delhi.
9. Dr. T. A. Koshy, Director, National Fundamental Education Centre, 38-A, Friends Colony (East), Mathura Road, New Delhi.
10. Mr . J. F. McDougall, Associate Secretary, Education Commission, New Delhi.
11. Dr. M. S. Mehta, Vice-Chancellor, Rajasthan University, Jaipur.
12. Mrs. A. R. Moore, Regional Adviser on Health Education, World Health Organization, W.H.O. House, Ring Road, New Delhi.
13. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
14. Dr. M. S. Randhawa, Special Secretary, Ministry of Food & Agriculture (Department of Agriculture), New Delhi.
15. Dr. K. G. Saiyidain, Member, Education Commission, New Delhi.
16. Dr. Hans Simons, Ford Foundation, 32, Feroze Shah Road, New Delhi.
17. Shri Sohan Singh, Asia Foundation, 29-Rajpur Road, Delhi.
18. Dr. S. M. S. Chari, Deputy Educational Adviser, Education Commission, New Delhi. *Secretary.*

Sub-Group on Literacy Education

Members

1. Mrs. Durgabai Deshmukh, Vice-Chancellor's Residence, University of Delhi, Delhi. ***Convener***
2. Shri A. R. Deshpande, Adviser (Social Education), Ministry of Education, New Delhi.
3. Dr. T. A. Koshy, Director, National Fundamental Education Centre, New Delhi.
4. Shri Mustaq Ahmed, Director, Literacy House, Lucknow.
5. Shri H. P. Saxena, Assistant Director, National Fundamental Education Centre, New Delhi.

Sub-Group on Role of Universities and Institutions of Higher Learning in Adult Education

Members

1. Shri Sohan Singh, Asia Foundation, New Delhi. *Convener*
2. Shri Bashiruddin, 33-A, Kasturba Gandhi Marg, Allahabad.
3. Dr. Nagendra, Chairman, University Extension Lectures Board, University of Delhi, Delhi.
4. Dr. K. G. Saiyidain, Member, Education Commission, New Delhi.
5. Dr. Hans Simons, Ford Foundation, New Delhi.
6. Shri Uma Shankar, Director, Adult Education Department, Rajasthan University, Jaipur.

Sub-Group on Education of Workers

Members

1. Dr. T. A. Koshy, Director, National Fundamental Education Centre, Friends Colony, New Delhi. *Convener*
2. Shri Abdul Qadir, Director-General, Employment & Training, Ministry of Labour & Employment, New Delhi.
3. Shri N. Bhadriah, President, Mysore State Adult Education Council, Mysore.
4. Shri L. S. Chandrakant, Joint Educational Adviser, Ministry of Education, New Delhi.
5. Shri Chenstal Rao, Secretary, Federation of Indian Chambers of Commerce and Industry, New Delhi.

6. Shri S. C. Datta, Secretary, Indian Adult Education Association, Indraprastha Estate, New Delhi.
7. Shri M. C. Nanavatty, Director (Social Education), Ministry of Food & Agriculture, New Delhi.
8. Shri Annasaheb Sahasrabuddhe, Chairman, Rural Industries Planning, Planning Commission, New Delhi.
9. Dr. R. K. Singh, Director, Rural Institute, Bichpuri (Agra), U.P.

Sub-Group on Role of Cultural Institutions in Adult Education

Members

1. Shri D. R. Kalia, Director, Delhi Public Library, Delhi. *Convener*
2. Shrimati Kamladevi Chattopadhyay, Chairman, All India Handicrafts Board, Willingdon Crescent, New Delhi.
3. Shri J. C. Mathur, Joint Secretary, Ministry of Food and Agriculture, New Delhi.
4. Dr. Grace Morley, Director, National Museum, New Delhi.
5. Dr. Mulkh Raj Anand, Punjab University, Chandigarh.
6. Dr. M. S. Randhawa, Special Secretary, Ministry of Food and Agriculture, New Delhi.

2. TASK FORCE ON AGRICULTURAL EDUCATION

1. Dr. B. P. Pal, Director, General and Vice-President, I.C.A.R. and Additional Secretary, Ministry of Food & Agriculture, New Delhi. *Convener*
2. Dr. Amir Ali, Director, Rural Institute, Jamia Millia, Jamia Nagar, New Delhi.
3. Dr. Anant Rao, Dean, U.P. Agricultural University, Pant Nagar.
4. Dr. Chintamani Singh, Dean, Veterinary College, Punjab Agricultural University, Hissar.
5. Dr. R. W. Cummings, Field Director, Rockefeller Foundation Programme in India, 17, Kautilya Marg, Chanakyapuri, New Delhi-21.
6. Prof. V. M. Dandekar, Centre for Advanced Study in Agricultural Economics, Gokhale Institute of Politics & Economics, Poona.
7. Dr. K. C. Kanungo, Head of the Division of Agricultural Economics, Indian Agricultural Research Institute, New Delhi.
8. Dr. A. B. Joshi, Dean and Deputy Director (Education), Indian Agricultural Research Institute, New Delhi.
9. Managing Director, Banana & Fruit Development Corporation, 7, 1st Main Road, C.I.T. Colony, Madras.
10. Mr. J. F. McDougall, Associate Secretary, Education Commission, New Delhi.
11. Dr. S. N. Mehrotra, Deputy Secretary, Education Department, Government of Uttar Pradesh, Lucknow.
12. Dr. S. K. Mukherji, Deputy Agricultural Commisisoner, Indian Council of Agricultural Research, Krishi Bhawan, New Delhi.
13. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
14. Dr. K. C. Naik, Vice-Chancellor, University of Agricultural Science, 9-XI Main, 16th Cross, Malleswaram, Bangalore-3.
15. Dr. N. K. Panikar, Director, Indian Programme, Indian Ocean Expedition, C.S.I.R., New Delhi.
16. Shri C. S. Ranganathan, Fertiliser Association of India, New Delhi.
17. Dr. S. C. Verma, Field Adviser (Agriculture), N.C.E.R.T., New Delhi.
18. Shri S. Ramanujam, Assistant Educational Adviser, Education Commission, New Delhi. *Secretary.*

3. TASK FORCE ON EDUCATIONAL ADMINISTRATION

1. Shri Prem Kirpal, Secretary, Ministry of Education & Member, Education Commission, New Delhi. *Convener*
2. Shri A. C. Deve Gowda, Director, Directorate of Extension Programmes for Secondary Education (N.C.E.R.T.), 7, Lancer Road, Timarpur, Delhi-6.
3. Dr. V. Jagannadham, Professor of Social Administration, Indian Institute of Public Administration, Indraprastha Estate, New Delhi.
4. Prof. M. V. Mathur, Member, Education Commission, New Delhi.
5. Dr. S. Misra, Director of Public Instruction, Orissa (Now Vice-Chancellor, Utkal University), Cuttack.
6. Dr. S. N. Mukherjee, Head of the Department of Educational Administration, (N.C.E.R.T.), B-2/6A, Model Town, Delhi-9.
7. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
8. Shri H. M. Patel, Chairman, Charotar Vidya Mandal, Vallabh Vidyanagar, *via* Anand, (Gujarat).
9. Dr. D. M. Sen, Education Secretary, West Bengal, (Now Vice-Chancellor, Burdwan University), Calcutta.
10. Shri J. D. Sharma, Director of Public Instruction, Punjab, Chandigarh.
11. Shri V. D. Sharma, Education Secretary, Rajasthan, Jaipur.

12. Dr. Rudra Dutt Singh, Head of the Research Project on Panchayati Raj Institutions, Indian Institute of Public Administration, Indraprastha Estate, New Delhi.
13. Miss S. Rajan, Assistant Educational Adviser, Education Commission, New Delhi. *Secretary*

4. TASK FORCE ON EDUCATIONAL FINANCE

1. Prof. M. V. Mathur, Member, Education Commission, New Delhi. *Convener*
2. Shri D. A. Dabholkar, Principal, Chintamanrao College of Commerce, Sangli (Maharashtra).
3. Dr. B. Dutta, Education Secretary, Govt of West Bengal, Calcutta.
4. Shri R. A. Gopalaswami. Member, Education Commission, New Delhi.
5. Shri K. L. Joshi, Secretary, University Grants Commission, New Delhi.
6. Dr. D. T. Lakdawala, Head of the Department of Economics, University of Bombay, Bombay-1.
7. Dr. Gautam Mathur, Head of the Department of Economics, Osmania University, Hyderabad.
8. Dr. Atmanand Misra, Director of Public Instruction, Madhya Pradesh, Bhopal.
9. Dr. Sadashiv Misra, Director of Public Instruction, (now Vice-Chancellor, Utkal University), Cuttack, Orissa.
10. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
11. Dr. K. A. Naqvi, Delhi School of Economics, University of Delhi, Delhi.
12. Dr. Pritam Singh, Director, National Council of Applied Economic Research, New Delhi.
13. Shri Gurbax Singh, Assistant Educational Adviser, Education Commission, New Delhi. *Secretary*

5. TASK FORCE ON HIGHER EDUCATION

1. Dr. K. G. Saiyidain, Member, Education Commission, New Delhi *Convener*
2. Shri J. W. Airan, Principal, Wilson College, Bombay-7.
3. Shri P. K. Bose, Principal, Bangabasi College, Calcutta.
4. Shri Chandrahasan, Head of the Department of Hindi, University of Kerala, Ernakulam.
5. Dr. V. S. Jha, Member, Education Commission, New Delhi.
6. Dr. A. C. Joshi, Adviser, Planning Commission, New Delhi.
7. Shri K. L. Joshi, Secretary, University Grants Commission, Bahadur Shah Zafar Marg, New Delhi-1.
8. Shri C. L. Kapur, Retired Director of Education and Education Secretary, Punjab, IE/5, Patel Road, Patel Nagar, New Delhi-12.
9. Dr. D. S. Kothari, Chairman, Education Commission & University Grants Commission, Bahadur Shah Zafar Marg, New Delhi-1.
10. Prof. M. V. Mathur, Member, Education Commission, New Delhi.
11. Shri P. G. Mavlankar, Principal, L. D. Arts college, Navrangpura, Ahmedabad.
12. Mr. J. F. McDougall, Associate Secretary, Education Commission, New Delhi.
13. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
14. Dr. P. J. Philip, Joint Secretary, University Grants Commission, Bahadur Shah Zafar Marg, New Delhi-1.
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17. Dr. Amrik Singh, Secretary, Inter-University Board of India and Ceylon, 1, Rouse Avenue, New Delhi.
18. Dr. R. K. Singh, Director, Balwant Vidyapeeth Rural Higher Institute, Bichpuri, Agra (U.P.).
19. Dr. H. J. Taylor, Principal, Union Christian College, Barapani, Shilong (Assam).
20. Miss. S. Rehman, Assistant Educational Adviser, Education Commission, New Delhi. *Secretary*

Special Invitees

1. Dr. C. Gilpatric, Visiting Professor of Philosophy, University of Delhi (The Rockefeller Foundation), Delhi-7.
2. Dr. M. S. Mehta, Vice-Chancellor, Rajasthan University, Jaipur.
3. Prof. M. Mehrotra, 43, Lal Quarters, Govinda Nagar, Kanpur-6.

Sub-Group on Equalisation of Educational Opportunities at University Level

1. Dr. R. K. Singh, Director, Balwant Vidyapeeth Rural Higher Institute, P.O. Bichpuri (Agra). *Convener*
2. Shri K. L. Joshi, Secretary, University Grants Commission, Bahadur Shah Zafar Marg, New Delhi-1.
3. Shri P. G. Mavlankar, Principal, L. D. Arts College, Navrangpura, Ahmedabad-9.
4. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.

5. Shri A. B. Shah, Executive Secretary, Indian Committee for Cultural Freedom, Army and Navy Building, 148, Mahatma Gandhi Road, Bombay-1.

Sub-Group on Rural Higher Education

1. Shri G. Ramachandran, Director, Gandhigram, Gandhigram P.O., Madurai District (Madras). *Convener*
2. Dr. H. Amir Ali, Director, Jamia Rural Institute, Jamia Millia Islamia, P.O. Jamia Nagar, New Delhi-25.
3. Shri K. L. Bordia, Director, Vidya Bhawan Rural Institute, Udaipur (Rajasthan).
4. Dr. V. S. Jha, Member, Education Commission, New Delhi.
5. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.

Sub-Group on Salaries of Teachers

1. Shri K. L. Joshi, Secretary, University Grants Commission, Bahadur Shah Zafar Marg, New Delhi-1. *Convener*
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4. Prof. S. A. Shumovsky, Member, Education Commission.

Sub-Group on University Standards

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2. Shri J. W. Airan, Principal, Wilson College, Bombay-7.
3. Shri A. R. Dawood, Member, Education Commission, New Delhi.
4. Dr. V. S. Jha, Member, Education Commission, New Delhi.
5. Shri M. N. Kapur, Principal, Modern School, New Delhi-1.
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Sub-Group on Evaluation at University Level

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5. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
6. Shri Shantinarayan, Principal, Hans Raj College, Delhi.
7. Shri Ishwarbhai Patel, Vice-Chancellor, Sardar Vallabhai Vidyapeeth, Vallabh Vidya Nagar, (via Anand).
8. Dr. Hans Simons, Consultant in General Education, The Ford Foundation, 32, Feroz Shah Road, New Delhi-1.
9. Dr. H. J. Taylor, Principal, Union Christian College, Barapani, Shillong.

Sub-Group on the Functions of a University

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2. Dr. V. S. Jha, Member, Education Commission, New Delhi.
3. Mr. J. F. McDougall, Associate Secretary, Education Commission, New Delhi.
4. Dr. R. K. Singh, Director, Balwant Vidyapeeth Rural Higher Institute, P.O. Bichpuri (Agra).

Sub-Group on Policy of Admissions and Sub-standard Institutions

1. Dr. V. S. Jha, Member, Education Commission, New Delhi. *Convener*
2. Dr. C. Gilpatric, Visiting Professor of Philosophy, University of Delhi (The Rockefeller Foundation), Delhi-7.
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5. Dr. R. K. Singh, Director, Balwant Vidyapeeth Rural Higher Institute, P.O. Bichpuri (Agra).

6. TASK FORCE ON MANPOWER

1. Shri R. A. Gopalaswami, Member, Education Commission, New Delhi. *Convener*
2. Shri Abdul Qadir, Director-General, Employment and Training, New Delhi.
3. Shri K. L. Joshi, Secretary, University Grants Commission, Bahadur Shah Zafar Marg, New Delhi-1.
4. Prof. M. V. Mathur, Member, Education Commission, New Delhi.

5. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
6. Shri R. Prasad, Director, Manpower, Ministry of Home Affairs, (now Development Commissioner, Bihar) New Delhi.
7. Dr. T. Sen, Member, Education Commission, New Delhi.
8. Dr. S. P. Aggarwal, Head of Division, Area Manpower, Institute of Applied Manpower Research, Indraprastha Estate New Delhi.

7. TASK FORCE ON TECHNIQUES AND METHODS IN EDUCATION

1. Dr. V. S. Jha, Member. Education Commission, New Delhi. *Convener*
2. Shri G. K. Athalye—later Shri S. L. Ahluwallia, Director, National Institute of Audio-Visual Education (N.C.E.R.T.). Indraprastha Estate, New Delhi.
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7. Dr. S. S. Kulkarni, Psychometrician, Department of Psychological Foundations, N.C.E.R.T., 2/3, Model Town, Delhi-9.
8. Shri J. C. Mathur, Joint Secretary, Ministry of Food and Agriculture, (Department of Agriculture) Krishi Bhavan, New Delhi.
9. Mr. J. F. McDougall, Associate Secretary, Education Commission, New Delhi.
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12. Dr. Paul Neurath, Ford Foundation Consultant. Educational Television, 222, Jor Bagh, New Delhi.
13. Miss S. Panandikar, Member, Education Commission, New Delhi.
14. Dr. Albert J. Perrelli, Expert, Central Institute of Education, N.C.E.R.T., 33, Chhatra Marg, Delhi-6.
15. Miss S. Rehman, Assistant Educational Adviser, Education Commission, New Delhi.
16. Mr. J. M. Ure—Later Mr. D. A. Smith, Chief Education Officer, British Council, 21, Jor Bagh, New Delhi.
17. Dr. S. M. S. Chari, Deputy Educational Adviser, Education Commission, New Delhi. *Secretary*

8. TASK FORCE ON PROFESSIONAL, VOCATIONAL AND TECHNICAL EDUCATION

1. Dr. T. Sen, Member, Education Com-Commission, New Delhi. *Convener*
2. Prof. S. K. Bose, Director, Indian Institute of Technology, Powai, Bombay.
3. Shri G. K. Chandiramani, Additional Secretary, Ministry of Education, New Delhi.
4. Shri L. S. Chandrakant, Joint Educational Adviser, Ministry of Education, New Delhi.
5. Dr. D. R. Dhingra, 3/40, Vishnupuri, Nawabganj, Kanpur.
6. Shri R. N. Dogra, Director, Indian Institute of Technology, Hauz Khas, New Delhi.
7. Prof. V. G. Garde, Principal, Malaviya Regional Engineering College, Jaipur (Rajasthan).
8. Shri R. A. Gopalaswami, Member, Education Commission, New Delhi.
9. Shri K. L. Joshi, Secretary, University Grants Commission, New Delhi.
10. Dr. P. K. Kelkar, Director, Indian Institute of Technology, Kanpur.
11. Mr. J. F. McDougall, Associate Secretary, Education Commission, New Delhi.
12. Col. S. G. Pendse, Director of Training, Directorate General of Employment and Training, New Delhi.
13. Shri S. C. Sen, Principal, Delhi College of Engineering, Delhi.
14. Shri R. K. Srivastav, Deputy Secretary, Directorate of Manpower, Ministry of Home Affairs, New Delhi.
15. Dr. H. C. Visvesvaraya, Deputy Director, Indian Standard Institute, New Delhi.
16. Shri S. Venkatesh, Deputy Educational Adviser. Education Commission, New Delhi. *Secretary*

9. TASK FORCE ON SCIENCE EDUCATION

1. Dr. D. S. Kothari, Chairman, Education Commission, New Delhi. *Convener*
2. Prof. S. Deb, Head of the Department of Geology, Jadavpur University, Jadavpur.
3. Prof. B. D. Jain, Professor of Chemistry, Delhi University, Delhi.
4. Miss P. Florence Nightingale, Lecturer, Science Education Unit, Hyderabad.
5. Prof. R. C. Paul, Head of the Department of Chemistry, Punjab University, Chandigarh.
6. Dr. R. N. Rai, Head of the Department of Science Education N.C.E.R.T., H-2/3, Model Town, Delhi-9.
7. Prof. T. S. Sadasivan, Director, Centre of Advanced Study in Botany, Madras University, Madras.

8. Dr. D. Shankernarayan, Development Officer, University Grants Commission, Bahadur Shah Zafar Marg, New Delhi.
9. Prof. Shantinarayan, Principal, Hansraj College, Delhi.
10. Dr. A. R. Verma, Director, National Physical Laboratory, New Delhi.
11. Dr. R. D. Deshpande, Development Officer, University Grants Commission, Bahadur Shah Zafar Marg, New Delhi—*Secretary*.
12. Shri I. C. Menon, Education Officer, University Grants Commission, Bahadur Shah Zafar Marg, New Delhi. *Secretary*

10. TASK FORCE ON SCHOOL EDUCATION

1. Shri A. R. Dawood, Member, Education Commission, New Delhi. *Convener*
2. Shri K. L. Gupta, Principal, M.B. Intermediate College, Brindaban.
3. Dr. G. S. Khair, Principal, Poona Anath Vidyarthi Griha, Sadashiv Peth, Poona-2.
4. Shri K. Kuruvila Jacob, Principal, The Hyderabad Public School, Begumpet, Hyderabad-16.
5. Dr. D. R. Mankad, Secretary, Gangajala Vidyapith, Aliabad, Jamnagar (Gujarat).
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Sub-Group on Secondary Education

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6. Dr. G. S. Khair, Principal, Poona Anath Vidyarthi Griha, Sadashiv Peth, Poona-2.
7. Shri K. Kuruvila Jacob, Principal, The Hyderabad Public School, Begumpet, Hyderabad.
8. Shri P. N. Mathur, Banasthali Vidyapeeth, Banasthali (Jaipur).
9. Shri S. G. Nadgir, Headmaster, K.E. Boards High School, Malmaddi, Dharwar.
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16. Dr. S. N. Saraf, Director, Education Division, Planning Commission, New Delhi.
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20. Shri Kailash Singh, Principal, D.A.V. Higher Secondary School, Mithapur, Patna.
21. Shri P. M. Cherian Tharakan, Headmaster, St. John's Model High School, Trivandrum.
22. Shrimati S. Doraiswami, Assistant Educational Adviser, Education Commission, New Delhi. *Secretary*

Sub-Group on Evaluation at the School Stage

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4. Dr. C. D. Deshpande, Director of Education, Maharashtra, Poona.
5. Shri L. L. Joshi, Chairman, Board of Secondary Education, Rajasthan, Jaipur.
6. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
7. Dr. H. J. Taylor, Principal, Union Christian College, Barapani (Shillong), Assam.

11. TASK FORCE ON STUDENT WELFARE

1. Shri A. R. Dawood, Member, Education Commission, New Delhi. *Convener*
2. Dr. V. S. Jha, Member, Education Commission, New Delhi.
3. Dr. D. R. Mankad, Gangajala Vidyapith, Aliabad, Gujarat State.
4. Dr. M. S. Mehta, Vice-Chancellor, Rajasthan University, Jaipur.
5. Dr. (Mrs.) Perin H. Mehta, Director, Bureau of Educational and Vocational Guidance, N.C.E.R.T., New Delhi.
6. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
7. Dr. Prem Pasricha, United States Educational Foundation in India, 12, Hailey Road, New Delhi.
8. Dr. V. Raramakrishna, Director, Central Bureau of Health Education, New Delhi.
9. Dr. A. S. Raturi, Dean of Students, Banaras Hindu University, Varanasi-5.
10. Dr. D. S. Reddy, Vice-Chancellor, Osmania University, Hyderabad.
11. Shri S. L. Saruparia, Research Fellow, Department of Economics, Rajasthan University, Jaipur.
12. Dr. Vikram Singh, Deputy Educational Adviser, Ministry of Education, New Delhi.
13. Shrimati S. Doraiswami, Assistant Educational Adviser, Education Commission, New Delhi. *Secretary*

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2. Shri Nauhria Ram, Deputy Educational Adviser, Ministry of Education, New Delhi.
3. Dr. Olive I. Reddick, United States Educational Foundation in India, 12, Hailey Road, New Delhi.

Sub-Group on Hostels

1. Dr. D. R. Mankad, Gangajala Vidyapith, Aliabad, Distt. Jamnagar (Gujarat).
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3. Shri S. L. Saruparia, Research Fellow, Department of Economics, Rajasthan University, Jaipur.

Sub-Group on Guidance and Counselling

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2. Dr. Prem Pasricha, United States Educational Foundation in India, 12, Hailey Road, New Delhi.
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Sub-Group on Health Services

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3. Miss F. Kornegay, Health Educator, World Health Organization, Indraprastha Estate, New Delhi.
4. Dr. V. Ramakrishna, Director, Central Health Education Bureau, New Delhi.
5. Dr. D. K. Roy, Medical Officer-in-Charge, World University Service Health Centre, University of Delhi, Delhi.
6. Dr. (Miss) Sebastian, Adviser in Maternity & Child Welfare, Directorate-General of Health Services, New Delhi.
7. Miss K. Sood, Deputy Assistant Director-General of Health Services, New Delhi.
8. Shrimati S. Doraiswami, Assistant Educational Adviser, Education Commission, New Delhi.

12. TASK FORCE ON TEACHER EDUCATION AND TEACHER STATUS

1. Miss S. Panandikar, Member, Education Commission, New Delhi. *Convener*
2. Dr. S. P. Aggarwal, Institute of Applied Manpower Research, Indraprastha Estate, New Delhi.
3. Dr. Reginald Bell, Expert, Teachers College, Columbia University Team c/o American Embassy, Faridkot House, New Delhi.
4. Shri A. C. Deve Gowda, Director, Directorate of Extension Programmes for Secondary Education, 7, Lancer Road, Timarpur, Delhi-6.
5. Dr. G. N. Kaul, Field Adviser, National Institute of Basic Education, D. 14/6, Model Town, Delhi-9.
6. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
7. Shri S. Natarajan, Director of Projects, The South Indian Teachers' Union Council of Educational Research, Robertsonpet, Raja Annamalaipuram, Madras-28.
8. Dr. K. G. Saiyidain, Member, Education Commission, New Delhi.
9. Dr. Salamatullah, Principal, Teachers College, Jamia Millia Islamia, Jamianagar, Delhi-25.

10. Dr. M. D. Paul, Deputy Educational Adviser, Education Commission, New Delhi. *Secretary*

Sub-Group on Teacher Education

1. Miss S. Panandikar, Member, Education Commission, New Delhi. *Convener*
2. Dr. Reginald Bell, Expert, Teachers College Columbia University Team, c/o American Embassy, Faridkot House, New Delhi.
3. Mrs. Nalini Das, Principal, Institute of Education for Women, 20-B, Judges' Court Road, Hastings House, Alipore, Calcutta.
4. Shri A. C. Deve Gowda, Director, Directorate of Extension Programmes for Secondary Education, N.C.E.R.T., 7, Lancer Road, Timarpur, Delhi-6.
5. Shri Dwarika Singh, Director, State Institute of Education, Bihar, Patna.
6. Shri V. S. Mathur, Principal, State College of Education, Patiala.
7. Mrs. I. Miri, Principal, Postgraduate Training College, Assam State, Jorhat.
8. Dr. A. Mujib, Head of the Department of Education, Aligarh University, Aligarh.
9. Dr. S. N. Mukerji, Head of the Department of Educational Administration, N.C.E.R.T., B-6/A, Model Town, Delhi-9.
10. Dr. (Mrs.) Chitra Naik, Director, State Institute of Education, Maharashtra, Poona-2.
11. Shri P. K. Roy, Principal, Central Institute of Education, (N.C.E.R.T.), 33, Chhatra Marg, Delhi.
12. Dr. K. G. Saiyidain, Member, Education Commission, New Delhi.
13. Dr. Salamatullah, Principal, Teachers' College, Jamia Millia Islamia, Jamianagar, Delhi-25.
14. Dr. R. K. Singh, Director, Rural Higher Institute, P.O. Bichpuri, Agra.
15. Miss M. Vergese, Principal, College of Women, Trivandrum.

Sub-Group on Evaluation in Teacher Education

1. Dr. Salamatullah, Principal, Teachers' College, Jamia Millia Islamia, Jamianagar, Delhi-25. *Convener*
2. Shri B. V. Bapat, Principal, Tilak College of Education, Poona.
3. Dr. R. H. Dave, Deputy Director, Directorate of Extension Programmes for Secondary Education, N.C.E.R.T., 7, Lancer Road, Timarpur, Delhi-6.
4. Dr. K. G. Desai, Principal, A.G. Teachers' College, Ahmedabad.
5. Prof. H. M. Dutta, Professor of Education and Director of Research School, B. R. Training College, Agra.
6. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
7. Miss S. Panandikar, Member, Education Commission, New Delhi.
8. Shri P. D. Sharma, Vice-Principal, Regional College of Education, Ajmer.
9. Dr. V. B. Taneja, Principal, Training College, Kurukshetra.

Sub-Group on Comprehensive Scheme of Teacher Training

1. Shri A. C. Deve Gowda, Director, Directorate of Extension Programmes for Secondary Education, 7, Lancer Road, Timarpur, Delhi-6. *Convener*
2. Dr. Reginald Bell, Expert, Teachers College Columbia Team, c/o American Embassy, Faridkot House, New Delhi.
3. Dr. G. S. Chaurasia, Principal, Regional College of Education, Mysore (Now O.S.D., Regional College of Education Unit, N.C.E.R.T.).
4. Dr. R. C. Das, Principal, Regional College of Education, Bhubaneswar.
5. Shri A. R. Dawood, Member, Education Commission, New Delhi.
6. Shri B. Mariraj, Director, State Institute of Education, Dharwar (Mysore).
7. Miss. S Panandikar, Member, Education Commission, New Delhi.
8. Shri G. C. Satpathy, Joint Director of Public Instruction, Orissa, Cuttack.

Sub-Group on Recruitment, Pay-Scales and Conditions of Service of Teachers

1. Miss S. Panandikar, Member, Education Commission, New Delhi. *Convener*
2. Shri P. Adinarayan, Deputy Director (Secondary Education), Andhra Pradesh, Hyderabad-22.
3. Shri B. R. Desai, Principal, Gokalbai High School, Vile Parle, Bombay-57.
4. Shri A. C. Deve Gowda, Director, Directorate of Extension Programmes for Secondary Education, N.C.E.R.T., 7, Lancer Road, Timarpur, Delhi-6.
5. Dr. V. S. Jha, Member, Education Commission, New Delhi.
6. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
7. Shri S. Natarajan, Director of Projects, The South Indian Teachers Union Council of Educational Research, Robertsonpet, Raja Annamalaipuram, Madras-28.
8. Shri A. V. Sriranga Raju, Deputy Director of Public Instruction (Examinations), Victory Hall, Bangalore.

Sub-Group on Statistical Calculations, Finance and Unit Costs

1. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi. *Convener*

2. Dr. S. P. Aggarwal, Head of Division, Area Manpower, Institute of Applied Manpower Research, Indraprastha Estate, Ring Road, New Delhi-1.
3. Shri A. R. Dawood, Member, Education Commission, New Delhi.
4. Dr. G. N. Kaul, Field Adviser, National Institute of Basic Education, D. 14/6, Model Town, Delhi-9.
5. Prof. M. V. Mathur, Member, Education Commission, New Delhi.

13. WORKING GROUP ON EDUCATIONAL BUILDINGS

1. Shri A. R. Dawood, Member, Education Commission, New Delhi
2. Shri R. K. Chhabra, Deputy Secretary, University Grants Commission, New Delhi.
3. Shri Dinesh Mohan, Director, Central Building Research Institute, Roorkee.
4. Shri B. V. Doshi, Architect, Designs Organization, Ahmedabad.
5. Mr. J. F. McDougall, Associate Secretary, Education Commission, New Delhi.
6. Shri M. M. Mistri, Assistant Director, National Buildings Organization, New Delhi.
7. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
8. Shri M. H. Pandya, Architect, Central Building Research Institute, Roorkee.
9. Shri C. B. Patel, Chairman, National Buildings Organisation, New Delhi.
10. Shri S. Rahaman, Architect, Central Public Works Department, New Delhi.
11. Shri J. L. Sehgal, Deputy Director, National Buildings Organization. New Delhi.
12. Shri T. S. Vedagiri, Chief Industrial Engineer and Chief Designs and Planning Engineer, Bhilai Steel Plant, Bhilai.
13. Dr. H. C. Visvesaraya, Deputy Director, Indian Standards Institute, New Delhi.
14. Lieut. General H. Williams, Consultant, (Construction), Planning Commission, New Delhi.
15. Shri S. Venkatesh, Deputy Educational Adviser, Education Commission, New Delhi. *Secretary*

14. WORKING GROUP ON EDUCATION OF THE BACKWARD CLASSES

1. Shri L. M. Shrikant, (Resident Vice-President, Bharatiya Adimjati Sewak Sangh), Thakkar Bapa Sadan, New Delhi. *Convener*
2. Shri Sashimeren Aier, Additional Development Commissioner, Nagaland, Kohima.
3. Shri N. V. Bapat, Secretary, Varnavasi Seva Mandal, Mandla (M.P.).
4. Acharya S. R. Bhise, Secretary, Adivasi Seva Mandal, Bordi, Dt. Thana, via Gholwad (Maharashtra).
5. Shri P. D. Kulkarani, Joint Director, Social Planning and Welfare, Planning Commission, New Delhi.
6. Shri J. Lakra, President, G. L. Mission Church, Ranchi (Bihar).
7. Shri D. J. Naik, M.P., President, Bhil Sewa Mandal, Dohad, Dt. Panchmahals (Gujarat).
8. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
9. Shrimati V. Rajlakshmi, Secretary, Kasturba Gandhi National Memorial Trust, Kasturba Gram, Distt. Indore (M.P.).
10. Shri T. Sanganna, Minister for Rural & Tribal Welfare, Orissa, Bhubaneswar.
11. Shri S. C. Sen Gupta, Joint Secretary, Department of Social Security, New Delhi.
12. Shri Manikya Lal Verma, M.P., 156, North Avenue, New Delhi.
13. Shri Vimal Chandra, Deputy Commissioner for Scheduled Castes and Scheduled Tribes, Ministry of Home Affairs, New Delhi.
14. Shri N. M. Wadiwa, M.P., Secretary, Bharatiya Adimjati Sewak Sangh, Chhindwara (M.P.).
15. Shri Gurbax Singh, Assistant Educational Adviser, Education Commission, New Delhi. *Secretary*

15. WORKING GROUP ON EDUCATIONAL STATISTICS

1. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi. *Convener*
2. Dr. S. P. Aggarwal, Head of Division, Area Manpower, Institute of Applied Manpower Research, New Delhi.
3. Shri R. K. Chhabra, Deputy Secretary, University Grants Commission, New Delhi.
4. Dr. G. P. Khare, Statistician, Asian Institute of Planning and Administration, Indraprastha Estate, New Delhi.
5. Shri D. Natarajan, Deputy Registrar-General, Office of the Registrar-General, New Delhi.
6. Dr. H. Webster, Columbia University Teachers' College Team working with N.C.E.R.T., New Delhi.
7. Shri Gurbax Singh, Assistant Educational Adviser, Education Commission, New Delhi. *Secretary*

16. WORKING GROUP ON PRE-PRIMARY EDUCATION

1. Miss S. Panandikar, Member, Education Commission, New Delhi. *Convener*
2. Smt. Bilquis Ghufran, Inspecting Officer, Central Social Welfare Board, Parlia-

ment Street, Jeevan Deep Building, New Delhi.

3. Kumari L. Jesudian, Principal, Balar Kalvi Nilayam, 2, Ritherdon Road, Vepery, Madras.
4. Mrs. Shalini Moghe, Principal, Montessori Training Institute, Bal Adhyapan Mandir, Pagnis Bag, Indore.
5. Shri Shesh Namle, Shishu Vihar, 118, Hindu Colony, Dadar, Bombay.
6. Shri M. C. Nanavatty, Director (Social Education), Department of Community Development, Ministry of Food, Agriculture, Community Development & Co-operation, New Delhi.
7. Kumari A. Pakrashi, Principal, Chittaranjan Teachers Training Centre, 6, Nafar Kundu Road, Calcutta-26.
8. Smt. Grace Tucker, Deputy Minister of Education, Mysore, Vidhan Saudha, Bangalore.
9. Kumari P. K. Varalakshmi, Technical Officer, Indian Council for Child Welfare, 4, Rouse Avenue, New Delhi-1.
10. Smt. Amrita Varma, Dean, Home Science Faculty of Education, M. S. University of Baroda, Baroda.
11. Dr. (Smt.) R. Muralidharan, Head, Department of Child Study Unit (N.C.E.R.T.), H-2/6, Model Town, Delhi-9. *Secretary*

17. WORKING GROUP ON SCHOOL COMMUNITY RELATIONS

1. Shri L. R. Desai, Vice-Chancellor, Gujarat University, Ahmedabad. *Convener*
2. Prof. Hulbe, Rural Life Development & Research Project, Ahmednagar College, Ahmednagar.
3. Dr. V. S. Jha, Member, Education Commission, New Delhi.
4. Shri H. B. Majumder, Director, National Institute of Basic Education, New Delhi.
5. Shri P. N. Mathur, Banasthali Vidyapeeth, Banasthali, Jaipur.
6. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
7. Shri M. C. Nanavatty, Director (Social Education) Department of Community Development, Ministry of Food, Agriculture, Community Development & Co-operation, New Delhi.
8. Shri H. Radhakrishna, Sarva Seva Sangh, Rajghat, Varanasi.
9. Dr. K. G. Saiyidain, Member, Education Commission, New Delhi.
10. Dr. R. K. Singh, Director, Rural Higher Institute, Bichpuri, Agra.
11. Shri M. P. Balakrishnan, Research Officer, Education Commission, New Delhi. *Secretary*

18. WORKING GROUP ON SCHOOL CURRICULUM

1. Miss S. Panandikar, Member, Education Commission, New Delhi. *Convener*
2. Shri J. P. Naik, Member-Secretary, Education Commission, New Delhi.
3. Shri A. R. Dawood, Member, Education Commission, New Delhi.
4. Shri L. S. Chandrakant, Joint Director, National Council of Educational Research and Training, New Delhi.
5. Dr. A. J. Perrelli, Specialist in Social Studies and Curriculum, Columbia University Teachers College Team in India, N.C.E.R.T., New Delhi.
6. Prof. B. Ghosh, Director, Department of Curriculum, Methods and Textbooks, N.C.E.R.T., New Delhi. *Secretary*

19. WORKING GROUP ON WOMEN'S EDUCATION

1. Dr. D. S. Kothari, Chairman, Education Commission, New Delhi. *Convener*
2. Smt. Durgabai Deshmukh, Vice-Chancellor's Residence, University of Delhi, Delhi.
3. Smt. Rajammal Devadas, Principal, Home Science College, Coimbatore.
4. Shri P. N. Mathur, Banasthali Vidyapeeth, Banasthali, Jaipur.
5. Shri J. P. Naik, Member-Secretary, Education. Commission, New Delhi.
6. Miss S. Panandikar, Member, Education Commission, New Delhi.
7. Dr. K. G. Saiyidain, Member, Education Commission, New Delhi.
8. Smt. Raksha Saran, Chairman, National Council for Women's Education, 6, Bhagwan Das Road, New Delhi.
9. Dr. Premlila V. Thackersey, Vice-Chancellor, S.N.D.T. Women's University, Bombay.
10. Miss S. Rajan, Assistant Educational Adviser, Education Commission, New Delhi. *Secretary*

APPENDIX V

PERSONS INTERVIEWED BY THE EDUCATION COMMISSION IN DELHI

1. Adiseshiah, Malcolm S. (Dr.), Deputy Director-General, U.N.E.S.C.O., Paris.

2. **All India Secondary Teachers' Federation**

   (i) Shri Satya Priya Roy, President.

   (ii) Shri Ram Prakash Gupta, General Secretary (Delhi).

   (iii) Smt. Anila Devi, Joint Secretary (Calcutta).

   (iv) Shri Chandreshwar Prasad Singh (Patna).

   (v) Shri Madhu Sudan Narain Lal (Uttar Pradesh).

   (vi) Shri B. P. Roy (Bihar).

   (vii) Shri S. K. Bhattacharya (West Bengal).

   (viii) Shri Pran Raj Sharma (Delhi).

   (ix) Shri R. S. Bhardwaj (Delhi).

   (x) Smt. Gian Darshan Kaur (Punjab).

3. Anthony, Frank, (M.P.), The All-India Anglo-Indian Association, Bombay Life Building, Connaught Circus, New Delhi-1.

4. Appadorai, A. (Dr.), Member, Union Public Service Commission, New Delhi.

5. Asrani, U. A. Retd. Professor, Banaras Hindu University, 52, Adarsh Nagar, Lucknow.

6. Avinashilingam, T. S., Director, Shri Ramakrishna Mission Vidyalaya, Perianaickenpalayam, District Coimbatore (Madras).

7. Barrow, A. E. T., (M.P.), Secretary, Council for the Indian School Certificate Examination, B-27, Nizam-ud-Din East, New Delhi.

8. Bhoothalingam, S., Secretary, Ministry of Finance, (Department of Economic Affairs), New Delhi.

9. Chagla, M. C., Union Minister for Education, New Delhi.

10. **Child Guidance School Society (Principals' Forum), Delhi.**

   Represented by:

   (i) Shri Jagat Singh.

   (ii) Shri Tejbhan Seth.

   (iii) Principal M. L. Rengen.

   (iv) Miss K. Sen Gupta.

   (v) Shri M. N. Kapur.

   (vi) Rev. Father T. V. Kunnunkal.

11. Chopde, S. D., Secretary, All India Association of Colleges of Physical Education, c/o Lakshmi Bai College of Physical Education, Gwalior.

12. Council for the Indian School Certificate Examination, New Delhi (Led by Shri A. E. T. Barrow, Secretary of the Council).

13. **Dakshina Bharat Hindi Prachar Sabha, T. Nagar, Madras-17.**

   Represented by:

   (i) Shri D. Srinivasa Iyenger.

   (ii) Shri M. Rajeswarayya.

   (iii) Shri G. Subramanian.

14. Daruvala, J. C. Honorary Executive Director, Council of World Tensions, South-East Asia Division, 6, Petit Road, Cumballa Hill, Bombay.

15. Das Gupta, Sugata, Gandhian Institute of Studies, Varanasi.

16. Dehejia, V. T., Chairman, State Bank of India, Bombay.

17. **Delhi School Managers' Association, Bagh Dewar, Delhi**

   Represented by:

   (i) L. Sultan Singh Jain.

   (ii) Shri Ram Kanwar Gupta.

   (iii) L. Girdhari Lal.

   (iv) L. Kidar Nath.

   (v) Shri R. B. Seth.

18. Desai, Morarji, (M.P.), 7, Thayagaraj Marg, New Delhi-11.

19. Deshmukh, C. D. (Dr.), Vice-Chancellor, Delhi University, Delhi.

20. Diwakar, R. R., (M.P.), Founder & Sole Trustee, Loka Shikshana Trust, 2, Residency Road, Bangalore-25.

21. **Editors/Journalists**

   (i) Basu, S. K., Editor, "The Hindustan Standard", Calcutta.

   (ii) D'Souza, A. J., Resident Editor, "The Hitavada", Nagpur.

   (iii) Ghamare, D. G., Editor, "The Tarun Bharat", Nagpur.

(iv) Ghosh, S. N., Editor, "The Pioneer", Lucknow.

(v) Gupta, Viswa Bandhu, Editor, "The Daily Tej", P.B. 1112, Delhi.

(vi) Krupanidhi, G. V., Editor, "Deccan Herald", Bangalore.

(vii) Malkani, K. P., Editor, "The Organizer", Delhi.

(viii) Mehta, K. M., Editor, "Sandesh", Ahmedabad.

(ix) Menon, K. A. Damodar, "Mathrabhumi", Ernakulam (Kerala).

(x) Narayanan, K. P., Editor, "Madhya Pradesh Chronicle", Bhopal.

(xi) Sham Lal, Editor, "The Times of India", New Delhi.

(xii) Thapar, Raj (Mrs.), "Seminar", New Delhi.

22. **Education Committee of the Delhi Municipal Corporation.**

Represented by:

(i) Shri Bansi Lal Chauhan, Chairman.

(ii) Shri Kula Nand Bhaik, Deputy Chairman.

(iii) Shri Ram Prakash Gupta, Member.

(iv) Shanti Devi Ditta, Member.

(v) Shri Aklaq Hussain, Member.

(vi) Shri D. L. Sharma, Education Officer, Delhi Municipal Corporation.

(vii) Dr. J. N. Mathur, Assistant Education Officer, Delhi Municipal Corporation.

23. **Family Life Institute, (Association for Moral and Social Hygiene), New Delhi.**

Represented by:

(i) Mrs. Shakuntala Lal.

(ii) Mrs. Mukand Rao.

(iii) Shri C. K. Basu.

(iv) Shri H. P. Mehta.

(v) Dr. W. Mathur.

(vi) Shri B. K. Bakshi.

24. Gadgil, D. R., Gokhale Institute of Politics and Economics, Poona-4.

25. Gajendragadkar, P. B., Chief Justice of India, 5, Hastings Road, New Delhi.

26. Ghosh, A. K., Secretary, Ministry of Education, New Delhi.

27. Govind Das, Seth (M.P.), Raja Gokuldas Mahal, Jabalpur.

28. Gupta, P. D., Ex. Vice-Chancellor, Agra University, Delight Cottage, Mussoorie.

29. **Headmasters of Primary and Middle Schools of the Delhi Municipal Corporation.** (led by Shri D. L. Sharma, Education Officer, D.M.C.).

(i) Agarwal, C. (Smt.), M. C. Girls Middle School, Tihar I, Delhi.

(ii) Chadha, S. (Smt.), Headmistress, Jamna Bazar I, Delhi.

(iii) Hussain, Syed, M. C. Primary School, Ganj Mir Khan, Delhi.

(iv) Manchanda, Santosh (Smt.) Headmistress, M. C. Middle School, Tihar I, Subhash Nagar, Delhi.

(v) Mehdi, S. Nasir, M. C. Senior Basic School, Okhla, Delhi.

(vi) Sharma, S. D., Officiating Deputy Education Officer, Municipal Corporation. Delhi.

(vii) Sharmista Devi (Smt.), M. C. Primary School, Khatta Hardinge Bridge, New Delhi.

(viii) Tek Chand, Headmaster, M. C. Middle School, Faiz Bazar I, Delhi.

(ix) Yadav, Chandan Singh, Headmaster, M. C. Prathmik School, R. K. Puram, Sector IV, New Delhi.

30. **Institution of Engineers (India), 8, Gokhale Road, Calcutta.**

Represented by:

(i) Shri N. S. Govinda Rao, President.

(ii) Shri B. Seshadri, Secretary.

31. **Jamaat-e-Islami Hind, Suiwalan, Delhi-6.**

Represented by:

(i) Shri Mohammad Yusaf.

(ii) Shri Afzal Husain.

32. Jayashinghe, P. S. Publisher, Asia Publishing House and President, Publishers' Association of India, Calicut Street, Ballard Estate, Bombay-1.

33. Jagjivan Ram, Union Minister for Labour and Employment, New Delhi.

34. Joseph, P. M. (Dr.) Principal, Lakshmi Bai College of Physical Education. Gwalior.

35. Joshi, A. C. (Dr.) Adviser (Education), Planning Commission, New Delhi.

36. Joshi, K. L. Secretary, University Grants Commission, New Delhi.

37. Kabir, Humayun (Prof.) M.P., 2, Moti Lal Nehru Place, New Delhi-1.

38. Kabir Shanti (Smt.) President. Youth Hostel Association of India, 2, Motilal Nehru Place, New Delhi.

39. Kamaraj, K. President, Indian National Congress, 4, Jantar Mantar Road, New Delhi.

40. Keskar, B. V. (Dr.) Chairman, National Book Trust, 3 Kushak Road, New Delhi-11.

41. Khera, S. S. Chairman, Hindustan Aeronautics Ltd., New Delhi.

42. Krishna Menon, V. K. (M.P.), 19, Teen Murti Marg, New Delhi.

43. Kunzru, H. N. Pandit, President, Servants of India Society, Sapru House, New Delhi.

44. Lalbhai, Kasturbhai, Shahibag, Ahmedabad.

45. Mahajani, G. S. (Dr.) Vice-Chancellor, Udaipur University, Udaipur.

46. Mathias, T. A. Rev. Fr. Principal, St. Joseph's College, Tiruchirapalli.

47. Mathur, H. C. (M.P.), 11 Electric Lane, New Delhi.

48. Mathur, J. C., Joint Secretary, Ministry of Food and Agriculture, New Delhi.

49. Mehta, Asoka, Deputy Chairman, Planning Commission, New Delhi.

50. Mehta, B. Chief Secretary, Government of Rajasthan, Jaipur.

51. Mehta, B. H. (Dr.) Director, Gondawana Centre, 84, Char Bungala, Versova (via Andheri).

52. **Members of the University Grants Commission.**

Represented by:

(i) Das, S. R. Vice-Chancellor, Visva Bharati, Shantiniketan.

(ii) Pavate, D. C. Vice-Chancellor, Karnatak University, Dharwar.

(iii) Wadia, A. R. (M.P.) New Delhi.

(iv) Joshi, K. P., Secretary, UGC.

53. Mugali, R. S. (Dr.) Principal, Willingdon College, Sangli.

54. Narayan, Jaya Prakash, Kadam Kuan, Patna.

55. Narayan, Shriman, Ambassador of India to Nepal, 3 Feroze Shah Road, New Delhi.

56. Oraon, Kartik, Deputy Chief Engineer (Designs), Heavy Engineering Corporation Ltd., Ranchi.

57. Pande, S. D. Secretary, Birla Education Trust, Pilani (Rajasthan).

58. Pant, K. C. (M.P.), Cl/35, Pandara Road, New Delhi-11.

59. Prasad, B. N. (Dr.) General President, Indian Science Congress, Lakshmi Niwas, George Town, Lucknow.

60. Prasad, Sidheshwar (M.P.), 52 South Avenue, New Delhi.

61. Pathania, A. S. (Maj. Genl.) Director-General, National Discipline Scheme, New Delhi.

62. Ramachandran, G., Secretary, Gandhi Peace Foundation, 2, Jantar Mantar Road, New Delhi.

63. Ranganathan, S. R. (Dr.) National Research Professor in Library Science, Documentation Research and Training Centre, Bangalore.

64. Ranganathananda (Swami) Ramakrishna Mission, Institute of Culture, Gole Park, Calcutta.

65. Rao, S. Mukanda, M. L. C. Besant Lane, Mangalore-3.

66. Rao, V. K. R. V. (Dr.) Member (Agriculture, Education and International Trade), Planning Commission, New Delhi.

67. Ray, Renuka (Smt.) (M.P.) 187 South Avenue, New Delhi.

68. Reddi, D. S. (Dr.) Vice-Chancellor, Osmania University, Hyderabad.

69. Sahasrabudhe, Annasaheb, Chairman, Standing Committee, The Rural Industries Planning Committee of the Planing Commission, New Delhi.

70. Sahi, I. D. N. Additional Secretary, Department of Community Development, Ministry of Food and Agriculture, New Delhi.

71. Sapru, P. N. (M.P.) 10 Feroze Shah Road, New Delhi.

72. Saran, Saraswati, Sub-Editor, Tribune, Ambala.

73. Sarkar, Chanchal, Press Institute of India, 66 Lucknow Road, Delhi-7.

74. Sham Lal, Resident Editor, Times of India, New Delhi.

75. Singh, T. P. Secretary, Ministry of Finance, Department of Expenditure, New Delhi.

76. Siqueira, T. N. (Rev. Fr.) Principal (Retired), St. Joseph's College, Tiruchirrapalli.

77. Sondhi, G. D. I.E.S. (Retd.) Subathu, Simla Hills.

78. Sri Prakasa, Vishranti Kutir, Rajpur, Dehra Dun.

79. **Standing Committee of Inter-University Board of India.**

Represented by:

(i) Sir C. P. Ramaswami Aiyer—Chairman.

(ii) Dr. (Mrs.) P. V. Thackersey—Member.

(iii) Dr. B. Malik—Member.

(iv) Shri T. M. Advani—Member.

(v) Dr. G. D. Mahajani—Member.

(vi) Dr. T. Sen—Member.

(vii) Prof. G. D. Parekh—Member.

80. Subramaniam, C. Union Minister for Food and Agriculture, New Delhi.

81. Tara Chand (Dr.) M.P. 8, Tughlak Road, New Delhi.

82. Tarlok Singh, Member, Planning Commission, New Delhi.

83. Thacker, M. S. (Prof.) Member, Planing Commission, New Delhi.

84. Virendra Singh (Major Gen.) Director-General, National Cadet Corps, New Delhi.

85. Wadia, D. N. (Dr.), Geological Adviser, Department of Atomic Energy, New Delhi.

86. Zaheer. S. Hussain (Dr.) Director General, Council of Scientific and Industrial Research, New Delhi.

APPENDIX VI

SECRETARIAT OF THE COMMISSION

Name	Designation
1. Shri J. P. Naik	Member-Secretary—from 1-9-64
2. Mr. J. F. McDougall	Associate Secretary—from 10-10-64
3. Shri T. S. Bhatia	Joint-Secretary—from 21-9-65
4. Dr. M. D. Paul	Deputy Educational Adviser—from 1-9-64 to 31-3-66
5. Dr. S. M. S. Chari	Deputy Educational Adviser—from 9-3-65
6. Shri Veda Prakasha	Deputy Educational Adviser—from 13-9-65 to 25-1-66
7. Dr. Vikram Singh	Deputy Educational Adviser—from 25-1-66 to 24-3-66
8. Shri S. Venkatesh	Deputy Educational Adviser—from 28-9-64
9. Miss S. Rajan	Assistant Educational Adviser—from 9-10-64
10. Shri Gurbax Singh	Assistant Educational Adviser—from 9-10-64
11. Miss S. Rehman	Assistant Educational Adviser—from 10-3-65
12. Mrs. S. Doraiswami	Assistant Educational Adviser —from 22-3-65
13. Shri S. Ramanujam	Assistant Educational Adviser—from 9-3-65 to 31-3-66
14. Shri M. P. Balakrishnan	Research Officer—from 26-11-64
15. Dr. Rajasekharan	Pool Officer, C.S.I.R.—from 21-1-65
16. Shri S. N. Lal	Assistant Education Officer—from 3-4-65 to 1-10-65
17. Shri A. K. Kashyap	Assistant Education Officer—from 20-3-65 to 31-3-66
18. Shri H. R. Gugnani	Assistant Education Officer—from 20-5-65 to 31-3-66
19. Shri P. N. Kaw	Assistant Education Officer—from 1-10-65 to 31-3-66
20. Shri D. P. Das	Section Officer—from 5-4-65
21. Shri M. K. Jain	Librarian—from 12-4-65

Officers of the N.C.E.R.T. working in the Commission

Name	Designation
22. Shri S. S. Dudani	Research Associate—from 1-11-64
23. Shri D. L. Sharma	Research Associate—from 1-11-64
24. Shri M. L. Kalra	Research Associate—from 1-11-64
25. Shri R. S. Trehan	Research Associate —from 1-11-64 to 16-6-1965
26. Shri C. L. Kaul	Research Associate—from 8-9-65

Officers of the U.G.C. associated with the work of the Task Force on Science Education

Name	Designation
27. Dr. R. D. Deshpande	Development Officer
28. Shri I. C. Menon	Education Officer

Officer of the Institute of Applied Manpower Research associated with the work of the Task Force on Manpower

Name	Designation
29. Dr. S. P. Aggarwal	Head of Division, Area Manpower

APPENDIX VII

LIAISON OFFICERS OF STATE GOVERNMENTS AND UNION TERRITORIES

Andhra Pradesh	1. Shri K. V. Ranga Reddy, Reader, State Institute of Education, Hyderabad
Assam	2. Shri G. C. S. Borooa, Additional Director of Public Instruction, Shillong
Bihar	3. Shri Santa Prasad, Deputy Director of Education, Patna
Gujarat	4. Shri V. H. Bhanot, Deputy Director of Education, Ahmedabad
Jammu & Kashmir	5. Shri R. L. Basur, Deputy Director of Education, Jammu Tawi
	6. Shri G. R. Dhar, Deputy Director of Education, Srinagar
Kerala	7. Shri P. K. Umashankar, Director of Public Instruction, Trivandrum
	8. Dr. K. Bhaskaran Nair, Director of Collegiate Education, Trivandrum
	9. Shri S. Rajaraman, Director of Technical Education, Trivandrum
Madhya Pradesh	10. Shri P. S. Kapoor, Science Consultant to the Director of Public Instruction, Bhopal
Madras	11. Shri K. Mohanarangam, Deputy Director of Public Instruction, Madras
Maharashtra	12. Shri J. A. Vakil, Deputy Director of Education, Poona
	13. Dr. (Mrs.) Chitra Naik, Director, State Institute of Education, Poona-2
Mysore	14. Shri T. V. Thimmegowda, Joint Director of Education, Bangalore
Nagaland	15. Shri Yajen Aier, Deputy Director of Education, Kohima
Orissa	16. Shri S. K. Panda, Deputy Director of Public Instruction (Planning), Bhubaneswar
Punjab	17. Shri K. N. Dutt, Joint Director of Public Instruction (Colleges), Chandigarh

Rajasthan	18. **Shri S. M. L. Shrivastav,** **Deputy Director of Education,** **(Planning and Social Education),** **Bikaner**
Uttar Pradesh	19. Dr. C. M. Bhatia, Deputy Director of Education, Allahabad
West Bengal	20. Shrimati K. K. Gupta, Assistant Director of Public Instruction (R. and Women's Education), Calcutta
Andaman & Nicobar Islands	21. Shri B. D. Singh, Education Officer, Port Blair
Dadra and Nagar Haveli	22. Shri M. S. Bijlani, Education Officer, Silvassa
Delhi	23. Shri B. S. Sehgal, Deputy Director of Education, Delhi
Goa, Daman and Diu	24. Dr. P. S. Varde, Deputy Director of Education, Panjim
Himachal Pradesh	25. Shri R. R. Gupta, Deputy Director of Education, Simla-4
Laccadive, Minicoy and Amindivi Islands	26. Shri P. M. Joseph, Secretary to the Administrator, Kozhikode
Manipur	27. Shri S. N. Kaul, Director of Education, Imphal
N.E.F. Agency	28. Shri M. N. Bardoloi, Assistant Director of Education, Shillong
Pondicherry	29. Shri A. David, Deputy Director of Public Instruction Pondicherry
Tripura	30. Shri A. Dasgupta, Deputy Director of Education, Agartala

APPENDIX VIII

PROGRAMME OF VISITS OF THE EDUCATION COMMISSION

I. States/Territories	Date of Visit
I *States*	
1. Rajasthan	11th to 16th January, 1965
2. Maharashtra	5th to 14th February, 1965
3. Mysore	15th to 20th February, 1965
4. Madhya Pradesh	22nd to 27th March, 1965
5. Uttar Pradesh	15th to 21st April, 1965
6. Bihar	26th April to 1st May, 1965
7. Punjab	10th to 15th May, 1965
8. Jammu & Kashmir	24th May to 13th June, 1965
9. Nagaland	18th to 22nd June, 1965
10. Andhra Pradesh	28th June to 3rd July, 1965
11. Gujarat	12th to 17th July, 1965
12. Madras	26th to 31st July, 1965
13. West Bengal	23rd to 28th August, 1965
14 Orissa	10th January, 1966
15. Kerala	2nd to 4th February, 1966
16. Assam	6th to 8th June, 1966
II. *Union Territories*	
1. Himachal Pradesh	1st to 4th November, 1965
2. Manipur	23rd to 25th November, 1965
III. *Central Universities*	
1. Jamia Millia	22nd September, 1965
2. Delhi University	5th November, 1965
3. Banaras Hindu University	15th to 17th November, 1965
4. Aligarh Muslim University	9th & 10th December, 1965

APPENDIX IX

EXPENDITURE INCURRED ON THE EDUCATION COMMISSION

The following is the statement of expenditure incurred on the Education Commission:

	Item	1964-65	1965-66	1966-67 (up to 30-6-1966)	Total
		Rs.	Rs.	Rs.	Rs.
1.	Pay of Officers	76,971·90	281,432·37	44,569·71	402,973·98
2.	Pay of Establishment	17,790·00	120,520·71	31,388·89	169,699·60
3.	Allowances, Honoraria, etc. . . .	99,837·82	602,497·63	66,359·42	768,694·87
4.	Other Charges	59,000·28	91,432·27	5,368·18	155,800·73
	GRAND TOTAL . . .	253,600·00	1,095,882·98	147,686·20	1,497,169·18

N.B. Pay bills of officers for the month of June 1966 totalling Rs. 12,016·45 were encashed during July 1966 and not appear in the above statement.

SUMMARY OF RECOMMENDATIONS

CHAPTER I: EDUCATION AND NATIONAL OBJECTIVES

1. The most important and urgent reform needed in education is to transform it, to endeavour to relate it to the life, needs and aspirations of the people and thereby make it a powerful instrument of social, economic and cultural transformation necessary for the realization of the national goals. For this purpose, education should be developed so as to increase productivity, achieve social and national integration, accelerate the process of modernization and cultivate social, moral and spiritual values. 1.20(6)*

2. **Education and Productivity.** The following programmes are needed to relate education to productivity:

(1) *Science Education.* Science education should become an integral part of school education and ultimately become a part of all courses at university stage also. 1.23-24 (6-7)

(2) *Work Experience.* Work-experience should be introduced as an integral part of all education.

(3) Every attempt should be made to orient work experience to technology and industrialization and to the application of science to productive processes, including agriculture. 1.25-33 (7-9)

(4) *Vocationalization.* Secondary education should be increasingly and largely vocationalized and in higher education, a greater emphasis should be placed on agricultural and technical education. 1.32 (9)

3. **Social and National Integration.** The achievement of social and national integration is an important objective of the educational system and the following steps should be taken to strengthen national consciousness and unity.

(1) *The Common School.* The common school system of public education should be adopted as a national goal and effectively implemented in a phased programme spread over 20 years. 1.36-38 (10-11)

(2) *Social and National Service.* Social and national service should be made obligatory for all students at all stages. These programmes should be organized concurrently with academic studies in schools and colleges.

(1) At the primary stage, programmes of social service should be developed in all schools on the lines of those developed in basic education.

(2) At the secondary stage, social service for a total of 30 days at the lower secondary stage and 20 days at the higher secondary stage (10 days a year) should be obligatory for all students. It may be done in one or more stretches.

(3) At the undergraduate stage, social service for 60 days in total (to be done in one or more stretches) should be obligatory for all students.

(4) Every educational institution should try to develop a programme of social and community service of its own in which all its students would be suitably involved for periods indicated above.

(5) Labour and social service camps should be organized by creating a special machinery for them in each district. Participation in such camps should be obligatory for all students for whom no programmes of social service have been organized in the educational institutions they attend.

(6) N.C.C. ~~should~~ be continued on its present basis till the end of the fourth five year plan. The authorities concerned should explore the possibility of providing this training, on a whole-time basis, in a continuous programme of about 60 days at the undergraduate stage. In the meanwhile, alternate forms of social service should be developed and as they come into operation, the NCC should be made voluntary. 1.39-48 (11-13)

(3) *Language Policy.* The development of an appropriate language policy can materially assist in social and national integration.

(4) Mother-tongue has a pre-eminent claim as the medium of education at the school and college stages. Moreover, the medium of education in school and higher

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*The figures at the end of each recommendation indicate respectively—

1. the number of the chapter;
2. the number of the paragraph (in international numerals); and
3. the number of the page (in brackets).

education should generally be the same. The regional languages should, therefore, be adopted as the media of education in higher education.

(5) The UGC and the universities should work out a programme for the adoption of these recommendations suitably for each university or a group of universities. The change-over should be completed within ten years.

(6) Energetic action is needed to produce books and literature, particularly scientific and technical, in regional languages. This should be made a responsibility of universities assisted by UGC.

(7) All-India institutions should continue to use English as the medium of education for the time being. The eventual adoption of Hindi should, however, be considered in due course, subject to certain safeguards.

(8) The regional languages should also be made the languages of administration for the regions concerned as early as possible so that higher services are not barred to those who study in the regional medium.

(9) The teaching and study of English should continue to be promoted right from the school stage. Encouragement should be given also to the study of other languages of international communication. The study of Russian needs special attention.

(10) It would be desirable to set up a few institutions, both at the school and university level, with some of the important world languages as media of education.

(11) English will serve as a link language in higher education for academic work and intellectual inter-communication. It is, however, equally obvious that English cannot serve as the link-language for the majority of the people. It is only Hindi which can and should take this place in due course. As it is the official language of the Union and the link language of the people, all measures should be adopted to spread it in the non-Hindi areas.

(12) In addition to Hindi, it is essential to provide multiple channels of inter-State communication in all modern Indian languages. In every linguistic region, there should be a number of persons who know the other modern Indian languages and some who are familiar with their literature and able to contribute to them. For this purpose, there should be adequate arrangements, both in schools and colleges, for teaching different modern Indian languages. In addition, steps should be taken to establish strong departments in some of the modern Indian languages in every university. At the B.A. and M.A. levels, it should be possible to combine two modern Indian languages. 1.49-62 (13-16)

(13) *Promotion of National Consciousness.* Promoting national consciousness should be an important objective of the school system. This should be attempted through the promotion of understanding and re-evaluation of our cultural heritage and the creation of a strong driving faith in the future towards which we aspire:

(a) The first would be promoted by well-organized teaching of the languages and literatures, philosophy, religions and history of India, and by introducing the students to Indian architecture, sculpture, painting, music, dance and drama. In addition, it would be desirable to promote greater knowledge, understanding and appreciation of the different parts of India by including their study in the curricula, by the exchange of teachers wherever possible, by the development of fraternal relations between educational institutions in different parts of the country, and the organization of holiday camps and summer schools on an inter-State basis designed to break down regional or linguistic barriers.

(b) Creation of a faith in the future would involve an attempt, as a part of the courses in citizenship, to bring home to the students the principles of the Constitution, the great human values referred to in its Preamble, the nature of the democratic socialistic society which we desire to create and the five year plans of national development.

(14) There is no contradiction between the promotion of national consciousness and the development of international understanding which education should simultaneously strive to promote.

(15) The educational programme in schools and colleges should be designed to inculcate democratic values. 1.63-68 (16-17)

4. **Education and Modernization.** (1) In a modern society, knowledge increases at a terrific pace and social change is very rapid. This needs a radical transformation in the educational system. Education is no

longer taken as concerned primarily with the imparting of knowledge or the preparation of a finished product, but with the awakening of curiosity, the development of proper interests, attitudes and values and the building up of such essential skills such as independent study and capacity to think and judge for oneself. This also involves a radical alteration in the methods of teaching and in the training of teachers.

(2) To modernise itself, a society has to educate itself. Apart from raising the educational level of the average citizen, it must try to create an intelligentsia of adequate size and competence, which comes from all strata of society and whose loyalties and aspirations are rooted to the Indian soil. 1.69-73 (17-19)

5. **Social, Moral and Spiritual Values.** The education system should emphasize the development of fundamental social, moral and spiritual values. From this point of view—

(a) the Central and State Governments should adopt measures to introduce education in moral, social and spiritual values in all institutions under their (or local authority) control on the lines recommended by the University Education Commission and the Committee on Religious and Moral Instruction;

(b) the privately managed institutions should also be expected to follow suit;

(c) apart from education in such values being made an integral part of school programmes generally, some periods should be set apart in the time-table for this purpose. They should be taken, not by specially recruited teachers but by general teachers, preferably from different communities, considered suitable for the purpose. It should be one of the important objectives of training institutions to prepare them for it;

(d) the university departments in Comparative Religion should be specially concerned with the ways in which these values can be taught wisely and effectively and should undertake preparation of special literature for use by students and teachers.

6. **Education about Religions.** It is necessary for a multi-religious democratic State to promote a tolerant study of all religions so that its citizens can understand each other better and live amicably together. A syllabus giving well chosen information about each of the major religions should be included as a part of the course in citizenship or as part of general education to be introduced in schools and colleges up to the first degree. It should highlight the fundamental similarities in the great religions of the world and the emphasis they place on the cultivation of certain broadly comparable and moral and spiritual values. It would be a great advantage to have a common course on this subject in all parts of the country and common textbooks which should be prepared at the national level by the competent and suitable experts in each religion. 1.74-80 (19-21)

CHAPTER II. THE EDUCATIONAL SYSTEM: STRUCTURE AND STANDARDS

7. **Structure and Duration.** (1) The standards in any given system of education at a given time depend upon four essential elements: (a) the structure or the division of the educational pyramid into different levels or stages and their inter-relationships; (b) the duration or total period covered by the different stages; (c) the quality of teachers, curricula, methods of teaching and evaluation, equipment and buildings; and (d) the utilization of available facilities. All these elements are inter-related, but they are not of equal significance.

— The structure which may be regarded as the skeleton of the educational system, is of the least importance.

— The duration or total period of education plays a more significant role; but it becomes crucial only when the available facilities are utilized to the full and no further improvement can be expected without the addition of time.

— The quality of different inputs is even more important, and with an improvement in these, it is possible to raise the standards considerably without affecting the structure or increasing duration.

— But probably the most important is utilizing available facilities and obtaining the maximum return at the existing level of inputs.

(2) The immediate efforts on which attention should be concentrated at the school stage are two: increasing the intensity of

utlization and improving the quality of inputs, other than time. With these, it is possible to add about a year of content to the school course. In addition, it is also necessary to increase the duration of the higher secondary stage to two years under a phased programme which will begin in the fifth plan and be completed by 1985.

(3) The new educational structure should consist of

- — one to three years of pre-school education;
- — a ten-year period of general education which may be subdivided into a primary stage of 7 to 8 years (a lower primary stage of 4 or 5 years and a higher primary stage of 3 or 2 years) and lower secondary stage of 3 or 2 years of general education or one to three years of vocational education (the enrolment in vocational courses being raised to 20 per cent of the total);
- — a higher secondary stage of two years of general education or one to three years of vocational education (the enrolments in vocational education being raised to 50 per cent of the total);
- — a higher education stage having a course of three years or more for the first degree and followed by courses of varying durations for the second or research degrees.

(4) The age of admission to Class I should ordinarily be not less than 6+.

(5) The first public external examination should come at the end of the first ten years of schooling.

(6) The system of streaming in schools of general education from Class IX should be abandoned and no attempt at specialization made until beyond Class X.

(7) Secondary schools should be of two types—high schools providing a ten-year course and higher secondary schools providing a course of 11 or 12 years.

(8) Attempts to upgrade every secondary school to the higher secondary stage should be abandoned. Only the bigger and more efficient schools — about one-fourth of the total number — should be upgraded. The status of the existing higher secondary schools should be reviewed from this point of view and if necessary, those that do not deserve the higher secondary status should be downgraded.

(9) A new higher secondary course, beginning in Class XI, should be instituted. Classes XI and XII (and during the transitional period Class XI only) should provide specialized studies in different subjects. Where, however, existing higher secondary schools with integrated course in Classes IX, X and XI are running satisfactorily, the arrangement may continue until Class XII is added. 2-01-21 (23-32)

8. **Transfer of the Pre-University Course.**

(1) The pre-university course should be transferred from the universities and affiliated colleges to secondary schools by 1975-76 and duration of the course should be lengthened to two years by 1985-86.

(2) The UGC should be responsible for effecting the transfer of all pre-university or intermediate work from university and affiliated colleges to schools.

(3) Simultaneously higher secondary class or classes should be started in selected schools by State Education Departments, as self-contained units, and assisted with adequate recurring grants.

(4) Boards of Secondary Education should be reconstituted to accept the responsibility for the higher secondary stage also. 2.22-24 (32-33).

9. **Lengthening the Duration of the Higher Secondary Stage.** (1) In the fourth plan, efforts should be concentrated on securing a better utilization of existing facilities, on making the necessary preparation for implementing the programme and on lengthening the duration of the course in a few selected institutions as pilot projects.

(2) The programme of lengthening the duration of the higher secondary stage should begin in the fifth plan and be completed by the end of the seventh plan. 2.25-29 (33-35).

10. **Reorganization of the University Stage.** (1) The duration of the first degree should not be less than three years. The duration of the second degree may be 2 to 3 years.

(2) Some universities should start graduate schools with a three-year Master's degree course in certain subjects.

(3) Three-year special courses for the first degree which begin at the end of the first year of the present three-year degree courses should be started in selected subjects and in selected institutions.

(4) Suitable bridges should be built between the existing courses and the new (longer) courses.

(5) Incentives in the form of scholar ships, etc., should be provided for those who take the longer courses.

(6) In Uttar Pradesh, the lengthening of the first degree course should begin with the establishment of three-year graduate schools in selected subjects and in selected universities. The first degree courses in other colleges should be raised to 3 years in a period of 15—20 years. 2.30-32 (35-36)

11. **Utilization of Facilities.** (1) Emphasis should be laid, in plans of educational reconstruction, on programmes of intensive utilization of existing facilities.

(2) The number of instructional days in the year should be increased to about 39 weeks for schools and 36 weeks for colleges and pre-primary schools.

(3) A standard calendar should be worked out by the Ministry of Education and the UGC in consultation with the State Governments and universities respectively. The number of other holidays should be cut down to ten in the year. Loss of instructional days due to examinations and other reasons should not exceed 21 days in the case of schools and 27 days in the case of colleges.

(4) Vacations should be utilized fully through participation in studies, social service camps, production experience, literacy drives, etc.

(5) The duration of the working day should be increased at the school stage. At the university stage, adequate facilities for self-study should be provided.

(6) Steps should be taken to ensure full utilization of institutional facilities such as libraries, laboratories, workshops, craft-sheds, etc., all the year round.
2.33-42 (36-40).

12. **Dynamic and Evolving Standards.** (1) An intensive effort should be made to raise standards continually for all stages of education. The first ten years of school education should be qualitatively improved so that the wastage at this stage is reduced to the minimum. Within a period of ten years, the standards reached at the end of Class X should be that now attained at the end of the higher secondary course. Similar efforts should be made to raise the standard of the university degrees by adding one year of content.

(2) A continual improvement of standards and their comparability between different parts of the country should be secured at the school stage through the creation of an adequate and efficient machinery at the State and National levels which will define, revise and evaluate national standards at the end of the primary and the lower and higher secondary stages.

(3) In order to raise standards, it is necessary to secure better coordination between different stages of education and to break the isolation in which educational institutions generaly function. From this point of view—

(a) universities and colleges should assist secondary schools in improving their efficiency through a variety of measures; and

(b) school complexes should be formed. Each complex should consist of a secondary school and all the lower and higher primary schools within its neighbourhood. All the schools in such a complex should form a cooperative group working for improvement. 2.43-52 (41-44)

13. **Part-time Education.** Part-time and own-time education should be developed on a larger scale at every stage and in every sector of education and should be given the same status as full-time education.
2.53-54 (44)

14. **Nomenclature.** A uniform system of nomenclature for the different stages and sub-stages of education should be evolved by the Government of India in consultation with State Governments. 2.55 (44-45)

CHAPTER III. TEACHER STATUS

15. Intensive and continuous efforts are necessary to raise the economic, social and professional status of teachers and to feed back talented young persons into the profession. 3.01-02 (46)

16. **Remuneration.** The most urgent need is to upgrade the remuneration of teachers

substantially, particularly at the school stage. 3.05 (47)

(1) The Government of India should lay down for the school stage, minimum scales of pay for teachers and assist the States and Union Territories to adopt equivalent or higher scales to suit their conditions. 3.08 (48)

(2) Scales of pay of school teachers belonging to the same category but working under different managements such as government, local bodies or private managements should be the same. This principle of parity should be adopted forthwith. But its full implementation may, if necessary, be phased over a programme of five years. 3.09 (48-50)

(3) The Commission proposes the following scales of pay:

Teachers	Remuneration	
		Rs.
1) Teachers who have completed the secondary course and have received two years of professional training.	Minimum for trained teachers .	150
	Maximum salary (to be reached in a period of about 20 years) .	250
	Selection grade (for about 15 p.c. of the cadre) .	250—300

N.B. The minimum salary of a primary teacher who has completed the secondary course should be immediately raised to Rs. 100; and in a period of five years, it should be raised to Rs. 125. Similarly, the minimum pay of a teacher, who has received two years of training, should be raised immediately to Rs. 125; and it should be raised to Rs. 150 in a period of five years. Untrained persons with the requisite academic qualifications should work on the starting salary until they are trained and become eligible for the scale.

Teachers	Remuneration	
(2) Graduates who have received one year's professional training.	Minimum for trained graduates .	220
	Maximum salary (to be reached in a period of 20 years) .	400
	Selection grade (for about 15 p.c. of the cadre)	300—500

N.B. Untrained graduates should remain on their starting salary of Rs 220 p.m. until they are trained and become eligible for the scale.

Teachers	Remuneration	
(3) Teachers working in secondary schools and having postgraduate qualifications	.	Rs. 300—600

N.B. On being trained, they should get one additional increment.

Teachers	Remuneration	
(4) Heads of secondary schools	Depending upon the size and quality of the school and also on their qualifications, the headmasters should have one or other of the scales of pay for affiliated colleges recommended below.	
	Lecturer	Rs.
(5) Teachers in affiliated colleges	Junior scale .	300—25—600
	Junior scale .	400—30—640 —40—800
	Senior Lecturer/ Reader	700—40—1100
	Principal I	700—40—1100
	II	800—50—1500
	III	1000—50— 1500

N.B. The proportion of lecturers in the senior scale to those in the junior scale should be progressively improved. By the end of the fifth plan, this proportion should be raised to about 75 per cent on an average.

Teachers	Remuneration	
		Rs.
(6) Teachers in university departments	Lecturer .	500—40—800 —50—950
	Reader .	700—50—1250
	Professor .	1000—50— 1300—60— 1600

N.B. (1) One-third of the professors to be in the senior scale of Rs. 1500—1800. Scales comparable to the supertime scales in IAS to be introduced for exceptionally meritorious persons and in selected Centres of Advanced Studies.

(2) The proportion of junior (lecturers) staff to senior (readers/professors) staff in the universities which is now about 3:1 should be gradually changed to 2:1.

Notes—(a) The above scales of pay for school teachers are at the current price level and include the existing dearness allowances. Suitable increases will, however, have to be made for rises in prices from time to time.

(b) Compensatory cost of living allowance given in cities, house-rent allowance or other allowances are *not* included. These will be in addition to the salary recommended above and should be given on a basis of parity.

(c) The scales of pay are to be integrally related to the programmes of qualitative improvement of teachers through improved methods of selection, and improvement in general and professional education.

(d) The scales are to be given to all teachers—government, local authority or private—on the basis of parity.

17. **Implementation of Scales at the University Stage.** (1) The scales proposed above for teachers in higher education have already been approved by Government. To facilitate their introduction, assistance from the Centre should be provided to meet additional expenditure on a sharing basis of 80 per cent from Central and 20 per cent from State funds. In the case of private colleges, Central assistance may even be provided on a 100 per cent basis.

(2) The introduction of these scales of pay should be linked with improvement in the qualifications of teachers and improvement in the selection procedures for their appointment. This should be done on the lines of recommendations of the Committee on Model Act for Universities. For the recruitment of professors, a slightly different procedure has been suggested.

(3) The qualifications of teachers in affiliated colleges should be the same as those for teachers in the universities. The method of recruitment for them should also be similar. A discriminating approach should be adopted, in regard to these, for privately managed colleges. Good institutions should be allowed greater freedom in the choice of their teachers and stricter control should be exercised where the management is not satisfactory.

3.12-13 (52-53).

18. **Implementation of Scales for School Teachers.** (1) Three main scales of pay should be recognized for school teachers. (a) for teachers who have completed the secondary school stage and are trained: (b) for trained graduates; (c) for teachers with postgraduate qualifications.

(2) There should be no teacher at the primary stage who has not completed the secondary school course and has not had two years of professional training.

(3) Headmasters of higher primary and lower primary schools with enrolments of more than 200 should be trained graduates. Their salaries should be the same as those of trained graduate teachers in secondary schools.

(4) The practice of creating posts in lower scales of pay and recruiting to these either teachers with lower qualifications when qualified teachers are available or recruiting qualified teachers to these posts and paying them at lower scales, should be abandoned.

(5) Scales of pay of secondary school teachers should be related to scales of pay for teachers in affiliated colleges and universities on the one hand and to those of primary teachers on the other.

(6) Scales of pay for headmasters of lower and higher secondary schools should have a definite relationship with those of teachers in affiliated colleges or even universities. That is to say, the scale of pay for headmasters should be the same as that for lecturers, readers, or even professors, depending upon the size, function and quality of the school.

(7) The proportion of teachers with postgraduate qualification in lower secondary schools should vary from 10 to 30 per cent, depending upon the size, function and quality of the school.

(8) Teachers with first and second class B.A./B.Sc. or M.A./M.Sc. or with M. Ed.. degree should be given advance increments in the scale.

(9) Professional training should be obligatory for all secondary school teachers.

(10) State Boards of School Education and the State Education Departments should prescribe qualifications of teachers and lay down proper procedures for selection, not only for Government schools, but also for those conducted by local authorities and private managements.

(11) Every private school recognized and aided by State Education Departments should be required to have a Managing Committee with representatives from the Department; the Department should prescribe the qualifications for teachers similar to those in Government institutions; every post to be filled should be adequately advertised and interviews held by duly constituted selection committees; and no grant-in-aid should be paid for the salary of a teacher appointed outside the rules. 3.14-19 (53-57)

19. **Promotional Prospects.** It is necessary to improve promotional prospects in the teaching profession in order to attract and retain men of talent. From this point of view, the following suggestions are made:

(1) *School Stage.* Qualified and trained teachers in primary schools should be considered for promotion as headmasters or inspectors of schools.

(2) Trained graduate teachers in secondary schools who have done outstanding work should be eligible for promotion to posts carrying salaries

of teachers with postgraduate qualifications.

(3) Secondary school teachers with the necessary aptitude and competence could be enabled to become university and college teachers. The UGC should give *ad hoc* grants to outstanding teachers to do research into problems to encourage them and incidentally to qualify themselves for work at the universities.

(4) Advance increments for teachers doing outstanding work should be made possible. Normally, a teacher reaches the maximum of his scale in a period of 20 years. It should be possible for about five per cent of the teachers to reach the top of the scale in about ten years and for another five per cent of teachers to reach the same in about fifteen years.

(5) *University Stage. Ad hoc* temporary posts in a higher grade should be created for a lecturer or reader who has done outstanding work and who cannot be given promotion for non-availability of a suitable post.

(6) In Departments doing postgraduate work, the number of posts at professorial level should be determined on the basis of ,requirements.

(7) It should be open to a university in consultation with UGC to offer remuneration, even beyond the special scale of Rs. 1600—1800 to outstanding persons. 3.20 (57)

20. **Relating Salaries to Costs of Living.** All teachers salaries should be reviewed every five years and the dearness allowance paid to teachers should be the same as that paid to government servants with the same salary. 3.21 (57-58)

21. **Welfare Services.** A general programme of welfare services for all school teachers should be organized in each State and Union Territory, the funds being contributed by teachers (at 1½ per cent of the salaries) and an equal amount being given by the State. The fund should be administered by joint committees of representatives of teachers and government. When such a fund is organized, the existing teachers' welfare fund set up by the Government of India may be advantageously merged in it. 3.22 (58)

22. **Need for Central Assistance.** The proposals for the improvement of salaries of school teachers should be given effect to immediately. Generous central assistance should be made available to State Governments for this purpose. 3.28 (59)

23. **Retirement Benefits.** (1) The system of retirement benefits to teachers should also be reorganized on the principles of uniformity and parity. That is to say, the retirement benefits given to employees of the Government of India should be extended automatically to teachers in the service of the State Governments in the first instance and then to teachers working under local authorities and private management. 3.29 (59-60)

(2) As an interim measure, the triple-benefit scheme should be more widely adopted both for teachers in local authority and private schools as well as for the university and college teachers.

(3) The normal retirement age for teachers in schools, colleges and universities should be made 60 years with provision for extension up to 65 years.

(4) A higher rate of interest should be given to teachers on their provident fund and for this purpose, a better system of investing these funds should be devised. 3.30-32 (60-61)

24. **Conditions of Work and Service.** (1) The conditions of work in educational institutions should be such as to enable teachers to function at their highest level of efficiency.

(2) The minimum facilities required for efficient work should be provided in all educational institutions.

(3) Adequate facilities for professional advancement should be provided to all teachers.

(4) In fixing the hours of work, not only actual classroom teaching, but all other work a teacher has to do should be taken into consideration.

(5) A scheme should also be drawn up under which every teacher will get a concessional railway pass to any part of India once in five years on payment of a reasonable contribution related to his salary. 3.33 (61)

(6) New conduct and discipline rules suitable for the teaching profession should

be framed for teachers in government service.

(7) The terms and conditions of service of teachers in private schools should be the same as for government schools. 3.34 (61-62)

(8) The provision of residential accommodation for teachers is extremely important. For this purpose, it is suggested that—

- (a) every effort should be made to increase residential accommodation for teachers in rural areas and State subsidies should be made available for the purpose;
- (b) a programme of building construction and grant of adequate house rent allowance should be adopted in all big cities;
- (c) cooperative housing schemes for teachers should be encouraged and loans on favourable terms should be made available for construction of houses; and
- (d) in universities and colleges, the target should be to provide residential accommodation to about 50 per cent of the teachers in the university and 20 per cent of them in affiliated colleges.

3.36 (62)

(9) Private tuitions should be discouraged and controlled. Special coaching for children who need it should be provided on an institutional basis.

(10) At the university stage, part-time consultancy or additional work, such as research by teachers in higher education should be permitted; and no payment should be required to be made to the institution if the earnings do not exceed 50 per cent of the salary. 3.38 (62-63)

(11) Teachers should be free to exercise all civic rights and should be eligible for public office at the local, district, State or national level. No legal restriction should be placed on their participation in elections, but when they do so, they should be expected to proceed on leave. 3.39 (63)

25. **Women Teachers.** (1) The employment of women teachers should be encouraged at all stages and in all sectors of education. Opportunities for part-time employment should be provided for them on a large scale.

(2) Adequate provision should be made for residential accommodation particularly in rural areas.

(3) The condensed courses for adult women operated by the Central Social Welfare Board should be expanded.

(4) Increasing facilities should be provided for education through correspondence courses.

(5) Wherever necessary, special allowances should be given to women teachers working in rural areas. 3.40 (63-64)

26. **Teachers for Tribal Areas.** (1) Teachers for tribal areas should be given special allowances, assistance for the education of their children and residential accommodation.

(2) Provision should be made for giving special training to teachers who are to work in tribal areas. 3.43 (64)

27. **Teachers' Organizations.** (1) Professional organizations of teachers which carry out work for the improvement of the profession and of education should be recognized by the Central and State Governments and consulted on matters relating to school education, general and professional education of teachers and their salaries and conditions of work.

(2) Joint Teachers' Councils should be constituted in each State and Union Territory to discuss all matters relating to teachers' salaries, conditions of work and service and welfare service. These should consist of representatives of teachers' organizations and officers of the State Education Department. Conventions should be developed to the effect that unanimous recommendations of the Council would be accepted by Government. In certain matters, there should be provision for arbitration when negotiations fail. 3.44 (64-65)

28. **National Awards.** The Ministry of Education should consider the following suggestions:

- — The number of national awards should be increased;
- — The selection committees should be strengthened; and
- — Travelling allowance given to the awardees should be similar to that sanctioned for Class I officers of Government. 3.48 (65-66)

CHAPTER IV. TEACHER EDUCATION

29. The professional preparation of teachers, being crucial for the qualitative improvement of education, should be treated as a key area in educational development and adequate financial provision should be made for it, both at the State and national levels. 4.01(67)

30. **Removing the Isolation of Teacher Training.** In order to make the professional preparation of teachers effective, teacher education must be brought into the mainstream of the academic life of the universities on the one hand and of school life and educational developments on the other. 4.03(68)

31. (1) To remove the existing isolation of teacher education from university life—

(a) education, as distinguished from pedagogy, should be recognized as an independent academic discipline and introduced as an elective subject in courses for the first and second degree: and

(b) schools of education should be established in selected universities to develop programmes in teacher education and studies and research in education, in collaboration with other university disciplines. 4.04-05(68-69)

(2) To remove the existing isolation of teacher education from schools—

(a) extension work should be regarded as an essential function of a teacher training institution and an Extension Service Department should be established in each institution—pre-primary, primary and secondary—as an integral part of it:

(b) effective alumni associations should be established to bring old students and faculty together to discuss and plan programmes and curricula:

(c) practice-teaching for teachers under training should be organized in active collaboration with selected schools which should receive recognition from the Education Department as cooperating schools and special grants for equipment and supervision; and

(d) periodic exchange of the staff of the cooperating schools and of the teacher training institutions should be arranged. 4.06-09(69-70)

(3) An intensive effort should be made to remove the existing separation among the institutions preparing teachers for different stages of education or for special fields such as craft or art or physical education by—

(a) implementing a phased programme of upgrading all training institutions to the collegiate standard with the ultimate objective of bringing all teacher education under the universities.

(b) establishing comprehensive colleges of education in each State on a planned basis:

(c) establishing a State Board of Teacher Education in each State to be responsible for all functions related to teacher education at all levels and in all fields. 4.10-12(70-71)

32. **Improving Professional Education.** The essence of a programme of teacher education is 'quality' and in its absence, teacher education becomes, not only a financial waste but a source of overall deterioration in educational standards. A programme of highest importance therefore is to improve the quality of teacher education. This can be done through—

(1) organization of well-planned subject-orientation or content courses, in collaboration with university departments (or postgraduate colleges), leading to insight into basic concepts, objectives and implications of subjects to be taught. 4.14-17(72)

(2) introducing integrated courses of general and professional education in universities; 4.18-20(72-73)

(3) vitalising professional studies and basing them on Indian conditions through the development of educational research: 4.21-22(73)

(4) using improved methods of teaching which leave greater scope for self-study and discussion and improved methods of evaluation which include continuous internal assessment of practical and sessional work as well as practice-teaching: 4.23-24(73-74)

(5) improving practice teaching and making it a comprehensive programme of internship: 4.25(74)

(6) developing special courses and programmes: and 4.26(74-75)

(7) revising the curricula and programmes at all levels of teacher education in the light of the fundamental objectives of preparing teachers for their varied responsibilities in an evolving system of education; 4.27-32 (75-76)

33. **Duration of Training Course.** The duration of the professional courses should be two years for primary teachers who have completed the secondary school course. It should be one year for the graduate students; but the number of working days in a year should be increased to 230. 4.15(72)

34. The State Boards of Teacher Education should conduct a survey of teacher education programmes and curricula and initiate the necessary revision. 4.34(76)

35. New professional courses must be developed to orientate headmasters and teacher educators to their special field of work. 4.26(74-75)

36. The postgraduate courses in education should be flexible and be planned to promote an academic and scientific study of education and to prepare personnel for specific fields requiring special knowledge and initiation. The duration of the courses should be increased to three terms. Quality is crucial at this stage and only institutions having properly qualified staff and facilities should be allowed to conduct them. 4.35-39(76-77)

37. **Improving the Quality of Training Institutions.** Early steps should be taken to improve training institutions for teachers on the following lines:

(1) *Secondary Teachers.* (a) The staff of secondary training colleges should have a double Master's degree in an academic subject and in education. A fair proportion of them should hold doctorate degrees. They should all have taken induction or orientation courses in teacher education.

(b) Qualified specialists in subjects like psychology, sociology, science or mathematics may be appointed on the staff even if they have not had professional training.

(c) Summer institutes should be organized for the inservice training of staff.

(d) No student should be allowed to specialize in the teaching of a subject unless he has studied it for his first degree or obtained an equivalent qualification prior to training.

(e) States and Union Territories should adopt a rule that teachers in secondary schools will ordinarily teach only those subjects which they had studied for a university degree. If they are required to teach subjects other than those they have studied, they should take a special course therein either by correspondence or in the Summer Institutes.

(f) Attempts should be made to recruit first and good second class students to teacher training institutions and adequate scholarships should be provided for them. 4.41-44(77-78)

(2) *Primary Teachers.* (a) The staff in institutions for training primary teachers should hold a Master's degree either in Education or in an academic subject as well as B.Ed. and should have undergone special induction courses in teacher education at the primary level.

(b) New appointments of primary teachers should be restricted to those who have completed at least ten years of general education; exceptions may be made for women teachers and teachers in tribal areas.

(c) Correspondence courses and liberal concessions for study leave should be made available to unqualified teachers in primary schools to improve their qualifications.

(d) Special courses should be organized for graduates entering primary teaching.

(e) The duration of the training course for primary teachers should be uniformly tow years for those who have completed the secondary school course. Teachers with different educational qualifications should not be put into the same course. 4.45-50 (78-80)

(3) *General.* It is necessary to introduce the following reforms in training institutions for primary as well as secondary teachers:

(a) All tuition fees in training institutions should be abolished and liberal provision made for stipends and loans.

(b) Every training institution should have an experimental or a demonstration school attached to it.

(c) Adequate hostel facilities for trainees and residential accommodation for staff should be provided.

(d) Libraries, laboratories, workshops, etc., are very inadequate at present in most institutions, especially at the primary level. These need to be improved. 4.51-53 (81)

(4) *Other Teachers.* Reforms on the above lines should be carried out in the training programmes for other categories of teachers.

4.40 (77)

38. **Expansion of Training Facilities.** The training facilities should be expanded on a priority basis. The objective should be to ensure that every teacher in a primary or a secondary school is either already trained at the time of his appointment or receives such training within three years of his appointment. From this point of view:

(1) each State should prepare a plan for the expansion of training facilities in its area so that the output of trained teachers meets the demand for teachers as well as the needs for in-service education;

(2) part-time facilities and correspondence courses should be provided on a large scale and care should be taken to see that the standards in full-time institutions are not diluted;

(3) the backlog of untrained teachers should be cleared at an early date through measures of the type recommended in the Report.

(4) The size of the institutions should be fairly large and they should be located on a planned basis.

4.54 (81-84)

39. **In-Service Education of School Teachers.** (1) A large scale and coordinated programme of in-service education for teachers should be organized by universities, training institutions and teachers' organizations for teachers at all levels. The target should be that every teacher will receive at least two or three months in-service education in every five years of his service.

(2) The programme of summer institutes for the in-service training of secondary school teachers should be extended, with systematic follow-up and active collaboration among the agencies concerned.

4.55-57 (84-85)

40. **Professional Preparation of Teachers in Higher Education.** (1) Some orientation to professional education is necessary for junior lecturers in higher education and suitable arrangements should be made for the purpose.

(2) Newly appointed lecturers should be given some time to acclimatize themselves to the institution and should be encouraged to attend lectures of good teachers.

(3) Regular orientation courses for new staff should be organized in every university and where possible, in every college.

(4) In the bigger universities, or groups of universities these courses may be placed on a permanent basis by establishing a staff college. 4.58-62 (85-87)

41. **Standards in Teacher Education:** (1) At the national level, the UGC should take the responsibility for the maintenance of standards in teacher education. The State Boards of Teacher Education should be responsible for the raising of standards at the State level.

(2) A substantial allocation of funds should be made available to the UGC in the fourth five year plan for improvement in teacher education in the universities.

(3) The UGC should set up a joint standing committee for teacher education in collaboration with the NCERT. It should consist of competent persons from the profession and should be responsible for the maintenance of standards in teacher education.

(4) The Government of India should make provision of funds in the Centrally-sponsored sector to assist State Governments to develop teacher education which is now outside the universities.

4.63-66 (87-77)

CHAPTER V. ENROLMENTS AND MANPOWER

42. **A National Enrolment Policy.** During the next twenty years, the national enrolment policy should have the following broad objectives:

—to provide effective general education of not less than seven years' duration to every child, on a free and compulsory basis; and to expand lower secondary education on as large a scale as possible;

- —to provide higher secondary and university education to those who are willing and qualified to receive such education, consistent with the demands for trained manpower and the need to maintain essential standards; and to provide adequate financial assistance to those who are economically handicapped;
- —to emphasize the development of professional, technical and vocational education and to prepare skilled personnel needed for the development of agriculture and industry;
- —to identify talent and to help it grow to its full potential;
- —to liquidate mass illiteracy and to provide an adequate programme of adult and continuing education; and
- —to strive continuously to equalize educational opportunities, beginning with the elimination of at least some of the more glaring inequalities. 5.02(89-90)

43. **Raising the Educational Level of the Average Citizen.** High priority should be given to programmes of raising the educational level of the average citizen—

(1) by providing five years of effective primary education to all children by 1975-76 and seven years of such education by 1985-86;

(2) by making part-time education for one year compulsory for all children in the age-group 11—14 who have not completed the lower primary stage and are not attending schools. The aim will be to make these children functionally literate and stop all further additions to the ranks of adult *illiterates; and*

(3) by developing programmes to liquidate adult illiteracy. 5.03(90)

44. **Enrolment Policies in Secondary and Higher Education.** (1) The enrolment policies in post-primary education should be based on a combination of four criteria: public demand for secondary and higher education; full-development of the pool of natural ability; capacity of society to provide educational facilities at required levels of quality; and manpower requirements.

(2) The public demand for secondary and higher education has increased immensely in the first three plans and will continue to increase in future. It sets up a high target which is beyond the resources of the country in terms of men, money or materials. It is therefore necessary to adopt a policy of selective admissions to higher secondary and university education in order to bridge the gap between the public demand and available facilities.

(3) Providing secondary and higher education to all potentially able students also sets up a high target which even affluent societies find it difficult to achieve. It will be obviously beyond our reach, at least in the immediate future. While striving towards this goal, therefore, the immediate objective of the national enrolment policy should be to ensure that at least all the gifted students (5 to 15 per cent of all the students) who complete primary or secondary education are enabled to study further and that their financial handicaps are overcome through the institution of a liberal programme of scholarships.

(4) There are internal constraints in every educational system which limit expansion of facilities, especially in secondary and higher education, *viz.*, the availability of competent teachers, physical plant and finance. These constraints have often been set aside in the past to meet the pressures of public demand and standards have been diluted. This temptation will have to be resisted in the larger interests of the country.

(5) Estimated requirements of manpower needs or available job opportunities form a good basis for planning the expansion of educational facilities. This broad recommendation has to be understood in the light of three reservations:

(a) a continuous effort should be made to improve the collection of necessary data and the techniques of forecasting and the estimates of manpower needs should be continuously revised and kept up-to-date;

(b) the quality of manpower produced should be equally emphasized; and

(c) the estimates of manpower needs should not be regarded as the only criterion—it should be suitably combined with other criteria in taking final decisions about expansion of educational facilities.

5.04-12 (90-92)

45. **A Strategy of Development.** The capacity of society to expand educational facilities in terms of real resources sets up minimum targets whereas the maximum targets are suggested by the public demand for secondary and higher education or the need to develop the available pool of native talent. The gap between these high and low targets can be bridged by considerations which emerge from the necessity to relate the output of the educational system to manpower needs and to equalize educational opportunities. These will indicate the priorities to be adopted, the different courses of study to be developed, the extent to which facilities should be provided in the different courses, and the manner in which enrolments in them could be made to include, after equality of access is provided for all, at least the best students in the community. 5.13(92)

46. **Future Requirements of Educated Manpower: The ISI/ISE Estimates.** We broadly accept the estimates of future requirements of educated manpower given in the ISI/LSE Paper. This will, however, have to be continually revised in the light of the best data available and kept up-to-date. The table given on page 95 (Table 5.3) shows the estimates of the required workers, stock and out-turn of educated persons during the next twenty years.

47. **Educational Implications of the Estimates.** The following are the main policy implications of these estimates:

- to restrict the unplanned and uncontrolled expansion of general secondary and higher education, if massive educated unemployment is to be avoided;
- to make special and intensive efforts to vocationalize secondary education and to develop professional education at the university stage; and
- to devise suitable machinery, both at the national and State levels, which will relate the estimates of manpower needs effectively to the output of the educational system so that, by and large, there is some assurance that a suitably trained person would be available for every job to be done and every educated person would find a job appropriate for his education and professional training. 5.26(97)

48. **Enrolments.** The enrolments implied in these targets of out-turn, workers and stock have been discussed in the appropriate context in the different sections of this Report. 5.40 (99-100)

49. **Machinery for Manpower Planning.** The first two of these have been discussed in their appropriate context in later chapters. With regard to the third, the following recommendations are made.

(1) At the *national* level, the Planning Commission, which is responsible for preparing estimates of manpower requirements in all sectors of national development, should set up a Standing Committee for Manpower. Its main responsibility should be to prepare and revise, from time to time, manpower forecasts for the overall output of the educational system as well as for different categories of specialists.

(2) At the *State* level, it may be desirable to set up State Committees on Manpower on the broad lines of the Standing Committee for Manpower at the Centre and having similar functions and responsibilities.

50. **Relating Manpower Estimates to Output of Educational Institutions.** The following measures will have to be taken to relate the output of the educational system to manpower needs:

(1) *National Level.* Planning at the national level should be done by the Centre in consultation with the States and should cover all sectors crucial for national development, where the mobility of trained personnel is or should be high, where it is very costly to set up institutions for training personnel or where the very high level staff required for such institutions is in short supply. These should include engineering, agricultural and medical education, and the preparation of teachers for higher education.

(2) *State Level.* The planning of the remaining sectors should be done at the *State* level by State Governments. The planning of facilities in secondary and higher education (excluding the sectors for which planning would be done at the Central level) should be done at the State level.

(3) The provision of vocational education—both of school and college standard—will have to be expanded in all areas on a priority basis in keeping with manpower needs.

(4) For enrolments in general education, however, which is under-developed in some areas and over-developed in others, a policy of equalization will have to be adopted. Decisions will have to be made by each State in view of its conditions; but as a general basis, the following may be suggested;

(a) In all areas where the level of expansion reached is below the national average in 1966, steps should be taken to promote expansion;

(b) In all areas where the level of expansion reached is about equal to the national average expected in 1986, a restrictive policy should be adopted, unless there are special reasons to the contrary;

(c) It will be for the Government of India to suggest the targets to be reached from time to time, at the State level. State Governments may, in their turn, indicate suitable targets at the district level;

(d) The planning of higher education should be done on a State-basis. All universities in the State should be involved in this. Each university should be required to prepare a five-year plan of the facilities to be provided in all its teaching departments and affiliated colleges and the output therefrom and these should be approved after bringing them into accord with manpower needs. In granting affiliations or expanding their departments, the universities should be required to follow these plans.

(e) It is also essential to have an authority at the district level which can plan all school education. This authority will plan in the light of general directives given from the Centre and the State. In order to assist in its work, local studies of manpower needs, etc., will have to be carried out. 5.43-48(102-105)

51. **Education and Employment.** We should move in the direction of giving every graduate an offer of employment alongwith his degree or diploma. From this point of view, the system of one year internship now prescribed for medical graduates should be extended to other categories of graduates. 5.49 (105-106)

52. **A Wider Perspective.** The basic problem of human resource development can be solved only against a wider perspective. From this point of view, it is necessary to formulate and implement integrated plans which will have three objectives: (1) to reduce the birth-rate by about half; (2) to bring about an expansion of employment: and (3) to provide such education as will qualify young people for specific jobs. Such integrated plans are needed at the national, State and district levels.

5.50-51 (106-107)

CHAPTER VI: TOWARDS EQUALIZATION OF EDUCATIONAL OPPORTUNITIES

53. **Fees in Education.** The country should work towards a stage when all education would be tuition free. From this point of view:

(1) tuition fees at the primary stage should be abolished in all government, local authority and aided private schools as early as possible and preferably before the end of the fourth plan.

(2) lower secondary education should be made tuition free in all government, local authority or aided private institutions as early as possible and preferably before the end of the fifth plan. If necessary, a phased programme may be drawn up for the purpose.

(3) for the next ten years, the main effort with regard to fees in higher secondary and university education should be to extend provision of tuition free education to all needy and deserving students. As a first step, the proportion of free studentships should be increased to 30 per cent of the enrolment. 6.08-15 (109-112)

54. **Other Private Costs.** Other private costs in education have increased greatly in recent years and not necessarily for educational reasons. Efforts are needed to reduce them to the minimum.

(1) Free textbooks and writing materials should be provided at the primary stage. Children freshly joining schools should be welcomed at a school function and presented with a set of books. Others should be presented with a complete set of books for the next year as soon as the results of the annual examinations are declared and before the long vacation starts so that they can use the vacations for further study.

(2) A programme of book-banks should be developed in secondary schools and institutions of higher education. The State Education Departments should have a fund at their disposal from which they can encourage the establishment of book-banks in secondary schools and a similar fund should be placed at the disposal of the UGC for organizing them in the universities and affiliated colleges.

(3) The libraries of secondary schools and institutions of higher education should contain an adequate number of sets of textbooks so that the students can have easy access to them.

(4) Grants for the purchase of books, which need not necessarily be textbooks, should be made to talented students—the top 10 per cent—in educational institutions. The scheme should begin in the universities and later on be extended to affiliated colleges and secondary schools.

55. **Scholarships.** The programme of scholarships has received considerable emphasis in recent years, but it needs reorganization on the following lines:

(1) The scholarships programme is a continuous process and has to be organized at all stages of education. At present, the programme is weak and needs to be strengthened at the school stage.

(2) It is necessary to evolve a more equitable and egalitarian basis for the award of scholarships.

(3) A scholarships programme will yield better results if it is accompanied by a programme to maintain an adequate number of quality institutions at every stage and in every sector and an attempt is made to place the talented students in these institutions.

(4) A careful watch should be kept at all points of transfer from one stage or sub-stage of education to another to ensure that all the abler students continue their studies further.

(5) An adequate machinery should be created for administering this combined programme of scholarships, placement and maintenance of quality institutions.
6.18 (114)

56. The following programme of scholarships is proposed at the different stages of education:

(1) *Primary Stage.* Steps should be taken to ensure that, at the end of the lower primary stage, no promising child is prevented from continuing his studies further and to this end, a scholarship of an adequate amount will have to be provided to every child that may need it. It has been assumed that the target should be to provide scholarships for 2.5 per cent of the enrolment at the higher primary stage by 1975-76 and to 5 per cent of the same enrolment by 1985-86.
6.19 (114)

(2) *Secondary Stage.* Steps should be taken to ensure that the top 15 per cent of the children in the age-group do get scholarships from higher primary to the secondary stage. To this end, the necessary financial assistance should be provided to about 10 per cent of the top students in Class VII or VIII in each higher primary school. At least one good secondary school, with adequate residential facilities, should be developed in each community development block and admission to such institutions should be regulated on the basis of merit.
6.20-23 (115)

(3) In every school, there should be a programme for the identification of talented students who should be provided with special enrichment programmes to suit their needs and to help in their growth.

(4) *University Stage.* At the university stage the target for the provision for scholarships should be as follows:

(a) Scholarships should be available to at least 15 per cent of the enrolment at the undergraduate stage by 1976 and to 25 per cent of such enrolment by 1986; and

(b) scholarships should be available to at least 25 per cent of the enrolment at the postgraduate stage by 1976 and to 50 per cent of such enrolment by 1986.

(5) There should be two kinds of scholarships:

(a) for those who have to stay in hostels; these should cover all the direct and indirect costs of education, such as tuition fees, books, supplies, etc.; and

(b) for those who can stay at home and attend schools or colleges: These should mainly cover direct and indirect costs.

At the lower stages, the scholarships of the second type would be most needed. As one goes up the educational ladder, the proportion of scholarships of the first type would have to be increased.

(6) Steps should be taken to study the indirect costs of education and living costs and to reduce them to the minimum. In particular, it is necessary to cut down hostel expenses by reducing the number of servants, etc.

(7) The amount of scholarships should be regulated in such a manner as to cover all costs. 6.24-26(115-116)

57. **National Scholarships.** (1) The scheme of national scholarships should be expanded. The target to be reached should be to cover the top 5 per cent of the students who pass out of the examinations by 1975-76 and 10 per cent of such students by 1985-86. The administration of the scheme should be still further simplified and decentralized. In particular, the power to issue entitlement cards should be delegated to the authorities holding the examinations at which these scholarships have been instituted.

(2) With a view to introducing a greater egalitarian element in the award of these scholarships, it is suggested that 50 per cent of these scholarhips should be awarded, as at present, on the State basis. The remaining 50 per cent should be awarded on the 'school-cluster' basis in which a group of schools with similar socio-economic background of students are grouped into a cluster and the top students from each cluster are awarded the scholarships. 6.27(116-118)

58. **University Scholarships.** To supplement the above, a scheme of university scholarships should be instituted and implemented through the UGC. The target to be reached should be to cover 10 per cent of the enrolment at the undergraduate stage and 20 per cent of the enrolment at the postgraduate stage by 1976.

59. **A Standing Committee** on Postgraduate and Research Scholarships should be set up at the national level in the Ministry of Education. It should consist of the representatives of the Ministries which award scholarships at the postgraduate stage and its main function would be to coordinate the different scholarship programmes.

6.28-30 (118)

60. **Scholarships in Vocational Education.** With regard to scholarships in vocational education, the following reforms are necessary:

(1) It is necessary to make a more intensive effort to introduce an egalitarian element in admissions.

(2) The admission examinations to IITs should be held in English and also in regional languages and the best students from each linguistic group should be selected, if necessary, on the basis of quota related to population. If some of these students are not quite up to the standard in English, this deficiency should be overcome by giving an intensive training in English to the selected students in their first year at the institute.

(3) At the school stage, about 30 per cent of the students should be given scholarships; and this proportion should be increased to 50 per cent at the collegiate stage. 6.31-33 (118-120)

61. **Scholarships for Study Abroad.** There should be a national programme for the award of scholarships to the best talented students for study abroad. About 500 scholarships should be awarded each year.

6.34(120)

62. **Loan Scholarships.** It is necessary to institute a programme of loan scholarships to supplement the outright grant scholarships described above. It should be organized on the following lines:

(1) The programme would be a supplement to that of outright scholarships which should be provided on the scale we have suggested.

(2) It would be essentially meant for students in the sciences and the professional courses where the chances of employment and levels of earning are comparatively better and are more likely to make the scheme successful. There should be no upper limit to the number of such loan scholarships in this sector and an attempt should be made to provide financial assistance to every needy student. To a limited extent and in deserving cases, the programme should be extended to cover arts students also.

(3) If a person who holds a loan scholarship joins the teaching profession, one-tenth

of the loan should be written off for each year of service. This will encourage good students to join this profession.

(4) For convenient administration of the loan scholarships programme, a National Loan Scholarships Board may be set up as recommended in the Report.

63. **Other Forms of Student Aid.** Some other forms of student aid need development.

(1) Transport facilities should be provided imaginatively to reduce the cost on hostels and scholarships, *e.g.*, we have seen schools in rural areas which provide bicycles to students who come from a distance.

(2) Day-Study Centres and lodging houses (*i.e.*, places where the students can stay throughout the day and even at night but can go home for food) should be provided on a liberal scale.

(3) Facilities for students to earn and pay a part of their educational expenses should be developed. 6.35-37 (120-121)

64. **General.** (1) In all programmes of scholarships, preferential consideration should be given to the needs of girls.

(2) The Government of India should assume the bulk of the responsibility for providing scholarships in higher education. At the school stage, this responsibility should vest in the State Governments. To develop a good programme of scholarships at the school stage, however, the funds needed for it should be provided in the Centrally sponsored sector in the next two plans. The State Governments may be able to develop the programme on their own thereafter. 6.39-41 (121-123)

65. **Handicapped Children.** The progress in providing educational facilities to handicapped children will be limited by two main considerations: lack of teachers and financial resources. A reasonable target will, however, be to provide, by 1986, education for about 15 per cent of the blind, deaf and orthopaedically handicapped children and to about 5 per cent of the mental retarded ones. This will mean the provision of educational facilities for about 10 per cent of the total number of handicapped children. As a part of this programme, it should be possible to have at least one good institution for the education of the handicapped children in each district.

66. In the educationally advanced countries, a great deal of stress is now being laid on the integration of the handicapped children into regular school programmes. We feel that experimentation with integrated programmes is urgently required in our country and that every attempt should be made to bring in as many children into the integrated programmes as possible.

67. In addition, it will be desirable to develop services on a pilot basis for some other categories of children who have peculiar educational needs, *viz.*, the partially-sighted, the speech-handicapped, the aphasic, the brain-injured and the mentally disturbed.

68. To develop the above programmes for the education of the handicapped children on proper lines, it will be necessary to emphasize the training of teachers, the co-ordination of the efforts of the different agencies working in the field and to promote adequate research into the problem.

6.42-49 (123-125)

69. **Regional Imbalances.** There are wide differences in the educational development in the different States. These become wider still at the district level. A reduction of these differences to the minimum is desirable and the programme for this will have to be pursued side by side with the wider programmes for reducing the imbalances in the socio-economic development of the different States and districts in the country. The solution of this complex problem will, however, be facilitated if action is taken on the following lines:

(1) A total elimination of these differences in educational development is neither possible nor desirable. What is needed, however, is a balancing factor, a deliberate and sustained effort to assist the less advanced areas to come up to at least certain minimum levels so that the gap between them and the advanced areas will be reduced.

(2) The district should be adopted as the basic unit for educational planning and development.

(3) At the State level, there should be a deliberate policy of equalization of educational development in the different districts and the necessary administrative and financial measures to this end should be taken.

(4) At the national level, it should be regarded as the responsibility of the Government of India to secure equalization of educational development in the different

States. The necessary programmes for this, including special assistance to the less advanced States, should be developed.

6.50-52 (125-135)

70. **Education of Women.** We fully endorse the recommendations of the three committees which have examined the problem of women's education in recent years: (a) The National Committee on the Education of Women under the chairmanship of Shrimati Durgabai Deshmukh; (b) The Committee on Differentiation of Curricula between Boys and Girls under the chairmanship of Shrimati Hansa Mehta; and (c) The Committee under the chairmanship of Shri M. Bhaktavatsalam which studied the problem in the six States where the education of girls is less developed.

71. We invite special attention to the following recommendations of the National Committee on Women's Education:

(1) The education of women should be regarded as a major programme in education for some years to come and a bold and determined effort should be made to face the difficulties involved and to close the existing gap between the education of men and women in as short a time as possible;

(2) Special schemes should be prepared for this purpose and the funds required for them should be provided on a priority basis: and

(3) Both at the Centre and in the States, there should be a special machinery to look after the education of girls and women. It should bring together officials and non-officials in the planning and implementation of programmes for women's education:

72. In addition, it will also necessary to give adequate attention to the education of girls at all stages and in all sectors.

73. The role of women outside the home has become an important feature of the social and economic life of the country and, in the years to come, this will become still more significant. From this point of view, greater attention will have to be paid to the problems of training and employment of women. Opportunities for part-time employment which would enable women to look after their homes and to have a career outside will have to be largely expanded. As the age of marriage continues to rise, full-time employment will have to be provided for almost all young and married women. As the programme of family planning develops, older women whose children have grown up, will also need employment opportunities. Teaching, nursing and social service are well-recognized areas wnere women can have a useful role to play. In addition, several new avenues will have to be opened out to them. 6.53-58 (135-139)

74. **Education of the Backward Classes.** (1) The existing programme for the education of the scheduled castes should continue and be expanded.

(2) Greater efforts are needed to provide educational facilities for the nomadic and semi-nomadic groups.

(3) Hostels should be provided for the children of the denotified communities.

75. **Education of the Tribal People.** The education of the tribal people deserves great emphasis and attention. We broadly agree with the recommendations made in this respect by the Commission on Scheduled Areas and Scheduled Tribes under the chairmanship of Shri U. N. Dhebar and in the seminars on the Education and Employment of the tribal people organized by the Planning Commission and the NCERT. We invite special attention to the following programmes in this context.

(1) At the primary stage, the provision of facilities will have to be improved and Ashram schools will have to be established in sparsely populated areas. The teachers should be invariably conversant with tribal languages. The medium of education for the first two years of the school should be the tribal language; and during this period, the children should be given oral instruction in the regional language. By the third year, the regional language should become the medium of education. The programmes of the schools should be attuned to tribal life and atmosphere.

(2) At the secondary stage, provision of schools, hostel facilities and scholarships has to be greatly expanded.

(3) In higher education, the administration of the scholarships programme will have to be decentralized and made more efficient.

(4) Provision for special tuition will have to be made both at the secondary and university stages.

(5) It is essential to develop cadres of persons who will devote themselves to the

service of the tribal people. In the early stages, these cadres will consist mostly of non-tribals but an effort has to be made to develop such cadres among the tribals themselves. From this point of view,

(a) non-official organizations working in the tribal areas should be encouraged.

(b) special sub-cadres should be formed among the official ranks with the object of selecting persons for work in the tribal areas. The emoluments for these sub-cadres should be good enough to attract the best persons available.

(c) promising young persons from the tribals should be selected and specially trained to work in tribal areas. The usual prescriptions regarding recruitment or minimum qualifications will often have to be set aside in this programme. 6.59-75 (139-143)

CHAPTER VII. SCHOOL EDUCATION: PROBLEMS OF EXPANSION

76. The entire pre-university period of education should be treated as one single and continuous unit. It may be subdivided into sub-standards such as pre-primary, lower and higher primary, and lower and higher secondary. But it has to be noted that the similarities between the problems of the different sub-stages are more significant than the differences. 7.01 (147-148)

77. **Pre-primary Education.** Pre-primary education is of great significance to the physical, emotional and intellectual development of children, especially those with unsatisfactory home backgrounds. An enrolment of five per cent of the population in the age-group 3 to 5 in the pre-primary schools proper and of 50 per cent in the age-group 5-6 in pre-school classes will be a reasonable target to be attained by 1986.

78. Pre-primary education should be developed on the following lines during the next twenty years:

(1) State-level development centres for pre-primary education should be set up in each State Institute of Education; in addition, a district level centre should be set up in each district for the development, supervision and guidance of pre-primary education in the area.

(2) Private enterprise should be made largely responsible for setting up and running pre-primary centres, the State assisting with grants-in-aid on the basis of equalization.

(3) Experimentation in pre-primary education should be encouraged especially to devise less costly methods of expanding it. This may be done on the Madras pattern. In the alternative, children's play centres should be attached to as many primary schools as possible and should function as pre-school classes.

(4) The State should maintain State and District level play centres, train pre-primary teachers, look after research and preparation of literature on pre-primary education, supervise and guide pre-primary schools and training institutions, assist private agencies with grants-in-aid and run model pre-primary schools.

(5) The programme of pre-primary schools should be flexible and consist of various types of play, manual and learning activities accompanied by sensorial education. 7.03-07 (148-150)

79. **Expansion of Primary Education.** The objective of primary education should be to prepare individuals to be responsible and useful citizens.

The constitutional directive of providing free and compulsory education for every child up to the age of 14 years is an educational objective of the highest priority and should be fulfilled in all parts of the country through the development of the following programmes:

(1) Five years of good and effective education should be provided to all children by 1975-76.

(2) Seven years of such education should be provided by 1985-86.

(3) Emphasis should be laid on the reduction of wastage and stagnation. The objective should be to ensure that not less than 80 per cent of the children that enter Class I reach Class VII in a period of seven years.

(4) Children who are not yet fourteen years old at the end of Class VII and who do not wish to study further should be retained in the educational system till they complete 14 years of age but should be provided with short vocational courses of their choice.

(5) Each State and district should be required to prepare a perspective plan for the development of primary education in its area in the light of the targets stated above and its local conditions. It should be given full assistance to move forward at its best pace; and care should be taken to see that its progress is not held up for want of financial resources. 7.08-11 (151-152)

80. **Universal Provision of Schools.** The expansion of primary schools should be so planned that a lower primary school is available within a distance of about a mile from the home of every child. A higher primary school should be available within one to three miles from the home of every child. 7.13 (152)

81. **Universal Enrolment.** A programme of universal enrolment should be organized simultaneously with emphasis on the following:

(1) The present heterogeneity of cohort in Class I should be reduced and the bulk of the students in this class should consist of children in the age-group 5-6 or 6-7;

(2) A system of pre-registration should be introduced;

(3) The transfer rate of students from the end of the lower primary stage to the higher primary (which is now about 80 per cent) should be raised to 100 per cent by the end of the fifth plan. 7.15-18 (152-154)

82. **Universality of Retention.** The most important programme to be implemented during the next ten years is to improve the quality of primary education and to reduce stagnation and wastage to the minimum. The target should be to reduce stagnation and wastage by about half by 1976 and to almost eliminate them by 1986.

(1) Stagnation and wastage are very high in Class I and their reduction should be a major programme. Of the various measures to be adopted for the purpose, three are very important:

(a) treating Classes I and II (and wherever possible even Classes I—IV) as one integrated unit;

(b) introducing a year of pre-school education; and

(c) adopting play-way techniques in Class I.

(2) Stagnation and wastage in other classes should be reduced by providing various forms of part-time education, by implementing a nation-wide programme of school improvement, and by an intensive programme of parental education.

(3) All children in the age-group 11—14 not attending schools and who have not completed the primary stage of education and become functionally literate, should be required to attend literacy classes for a period of at least one year. The classes should be organized in primary schools and in a flexible manner to suit the convenience of the pupils. They should begin on a voluntary basis; but compulsion may be tried when the local community has become familiar with the concept.

(4) Similar facilities for part-time education should be provided for children who have completed the lower primary stage and who desire to study further. (Their magnitude may be 10 per cent of the total enrolment in 1975-76 and 20 per cent in 1985-86). The curriculum may follow the general education pattern or contain a large vocational element at required by local needs. 7.19-35 (154-161)

83. **Education of Girls—Primary Stage.** The education of girls requires special attention in fulfilling the constitutional directive and should be accelerated on the lines of the measures recommended by the National Committee on Women's Education. 7.38 (162)

84. **Improvement of Quality.** Expansion of facilities at the primary stage and programmes of universal enrolment and retention should be accompanied by qualitative improvement. 7.42 (164)

85. **Expansion of Secondary Education.** (1) Enrolments in secondary education should be regulated during the next 20 years by (a) proper planning of the location of secondary schools, (b) maintaining adequate standards and to that end, by determining the enrolment in terms of facilities available, and (c) selecting the best students.

(2) A development plan for secondary education should be prepared for each district and implemented in a period of ten years. All new institutions should satisfy essential standards, and existing institutions should be raised to the minimum level.

(3) The best students should be selected for admission into secondary schools, through a process of self-selection at the

lower secondary stage, and on the basis of external examination results and school records at the higher secondary stage.
7.43-46 (164-170)

86. **Vocationalizing Secondary Education.** (1) Secondary education should be vocationalized in a large measure and enrolments in vocational courses raised to 20 per cent of total enrolment at the lower secondary stage and 50 per cent of total enrolment at the higher secondary stage by 1986.

(2) A variety of part-time and full-time facilities in vocational education should be available at both these stages to meet the needs of boys and girls, in urban and rural areas. Special sections should be set up in the Education Departments to help young people who drop out after Class VII or VIII to obtain training on a full-time or part-time basis, and to be in overall charge of the organization of these courses.

(3) The Central Government should provide special grants to State Governments in the centrally sponsored sector for the vocationalization of secondary education.
7.47-49 (170-174)

87. **Part-time Education.** Facilities for part-time education should be provided on a large scale at the lower and higher secondary stages, in general and vocational courses. A desirable target would be 20 per cent of the total enrolment, at the lower secondary stage and 25 per cent at the higher secondary stage. Special emphasis will have to be placed on agricultural courses for those who have taken to farming as a vocation and on courses in home science or household industries for girls.
7.50-51 (174-175)

88. **Education of Girls: Secondary Stage.** (1) Efforts should be made to accelerate the expansion of girls education so that the proportion of girls to boys reaches 1:2 at the lower secondary stage and 1:3 at the higher secondary stage in 20 years.

(2) Emphasis should be placed on establishing separate schools for girls, provision of hostels and scholarships, and part-time and vocational courses. 7.52-53 (175-176)

89. **Planning and Location of Schools.** (1) A national policy for the location of new institutions of each category should be adopted so as to avoid waste and duplication. The second education survey should be used for the careful planning of the location of educational institutions.

(2) Public opinion should be educated to accept mixed schools at the primary stage and the sharing of bigger and efficient schools in common. Villages should be grouped so as to make the economic provision of primary schools possible.

(3) At the secondary stage, the establishment of small and uneconomic institutions should be avoided, and existing uneconomic schools should be consolidated.

(4) Vocational schools should be located near the industry concerned.
7.55-63 (176-82)

Chapter VIII: School Curriculum

90. In recent years, the explosion of knowledge and the reformulation of many concepts in science have highlighted the inadequacy of existing school programmes and brought about a mounting pressure for a radical reform of school curriculum. A unified approach should be taken to the framing of the entire school curriculum, a new definition of the content of general education and a new approach to the place of specialisation. 8.01-82 (183-184)

91. **Essentials of Curricular Improvement.** (1) School curricula should be upgraded through research in curriculum development undertaken by University Departments of Education, training colleges, State Institutes of Education and Boards of School Education; (b) periodical revision based on such research; (c) the preparation of textbooks and teaching-learning materials; and (d) the orientation of teachers to the revised curricula through in-service education.

(2) Schools should be given the freedom to devise and experiment with new curricula suited to their needs. A lead should be given in the matter by training colleges and universities through their experimental schools.

(3) Ordinary and advanced curricula should be prepared by State Boards of School Education in all subjects and introduced in a phased manner in schools which fulfil certain conditions of staff and facilities.

(4) The formation of Subject Teachers' Associations in the different school subjects will help to stimulate experimentation and in the upgrading of curricula. The State Education Departments, State Institutes of Education and NCERT should help the associations in their educational activities and coordinate their work. 8.03-09 (184-186)

92. Organization of the Curriculum. (1) In non-vocational schools, a common curriculum of general education should be provided for the first ten years of school education, and diversification of studies and specialisation should begin only at the higher secondary stage.

(2) Standards of attainment should be clearly defined at the end of each sub-stage.

(3) At the lower primary stage, the curriculum should be simple with reduced load of formal subjects and emphasis on language, elementary mathematics and environmental studies. A study of problems relating to beginning reading accompanied by a vigorous programme of improving reading instruction at the lower primary stage should receive great emphasis.

(4) At the higher primary stage, the curriculum will broaden and deepen, teaching methods will become more systematic, and standards of attainment more specific.

(5) At the lower secondary stage, study of subjects will gain in rigour and depth.

(6) At the higher secondary stage, courses will be diversified in such a manner as to enable pupils to study a group of any three subjects in depth with considerable freedom and elasticity in the grouping of subjects. In order to ensure the balanced development of the adolescent's total personality, the curriculum at this stage should provide half the time to the electives, one-fourth of the time to the languages, and one-fourth to physical education, arts and crafts, and moral and spiritual education.

(7) At the higher primary stage, enrichment programmes should be provided for the talented children. It may take the form of additional subject or greater depth in the same subject.

(8) At the secondary stage, courses should be provided at two levels—ordinary and advanced—beginning with Class VIII. The programme may be done within or outside school hours or on a self-study basis. A beginning may be made with advanced courses in mathematics, science and languages at the lower secondary stage and in all the specialised subjects at the higher secondary stage. 8.10-29(186-191)

93. Study of Languages. (1) The language study at the school stage needs review and a new policy regarding language study at the school stage requires to be formulated.

(2) The modification of the language formula should be guided by the following guiding principles:

(a) Hindi as the official language of the Union enjoys an importance next only to that of the mother-tongue;

(b) A working knowledge of English will continue to be an asset to students;

(c) The proficiency gained in a language depends as much upon the types of teachers and facilities as upon the length of time in which it is learnt.

(d) The most suitable stage for learning three languages is the lower secondary (Classes VIII-X).

(e) The introduction of two additional languages should be staggered;

(f) Hindi or English should be introduced at a point when there is greatest motivation and need;

(g) At no stage should the learning of four languages be made compulsory.

(3) The three language formula modified on these principles should include (a) the mother-tongue or the regional language; (b) the official language of the Union or the associate official language of the Union so long as it exists; and (c) a modern Indian or European language not covered under (a) and (b) and other than that used as the medium of education.

(4) At the lower primary stage the pupil will ordinarily study only one language—the mother-tongue or the regional language. At the higher primary stage, he will study two languages—the mother-tongue (or the regional language) and the official language of the Union (or the associate language). At the lower secondary stage, he will study three languages, the mother-tongue (or the regional language); the official or associate official language; and a modern Indian language, it being obligatory to study the official or the associate official language which he had not studied at the higher primary stage. At the higher secondary stage, only two languages will be compulsory.

(5) The study of important modern library languages other than English should be made possible in selected schools in each State with option to study them in lieu

of English or Hindi. Similarly, in non-Hindi areas, the study of modern Indian languages should be made possible in selected schools with a similar option to study them in lieu of English or Hindi.

(6) The study of English and Hindi will be indicated in terms of hours of study and level of attainment. Two levels of attainment should be prescribed in the official and associate official languages—one for a three-year and one for a six-year study.

(7) The study of a language should not be compulsory in higher education.

(8) A nation-wide programme should be organized for the promotion of the study of Hindi on a voluntary basis but the study of the language should not be forced on unwilling sections of the people.

(9) The burden of studying languages is made heavier by the great differences in script. Some literature in every modern Indian language should be produced in Devanagari and Roman scripts. All modern Indian languages should also adopt the international numerals.

(10) The teaching of English should ordinarily not begin earlier than Class V after adequate command has been acquired over the mother-tongue. The introduction of the study of English earlier than Class V is educationally unsound.

(11) The study of classical Indian languages such as Sanskrit or Arabic should be encouraged on an optional basis from Class VIII and should be positively emphasized in all universities. Advanced Centres of Study may be set up in selected universities in these languages. No new Sanskrit University should be established.

8.30-49 (191-197)

94. **Science and Mathematics Education.** Science and mathematics should be taught on a compulsory basis to all pupils as a part of general education during the first ten years of schooling.

(1) *The Study of Science.* In the lower primary classes science teaching should be related to the child's environment. The Roman alphabet should be taught in Class IV to facilitate understanding of internationally accepted symbols of scientific measurement and the use of maps, charts and statistical tables.

(2) At the higher primary stage emphasis should be on the acquisition of knowledge and the ability to think logically, to draw conclusions and to make decisions at a higher level. A disciplinary approach to the teaching of science will be more effective than the general science approach.

(3) A science corner in lower primary schools and a laboratory-*cum*-lecture room in higher primary schools are minimum essential requirements.

(4) At the lower secondary stage, science should be developed as a discipline of the mind. The newer concepts of physics, chemistry and biology and the experimental approach to the learning of science should be stressed.

(5) Science courses at an advanced level may be provided for talented students in selected lower secondary schools with necessary facilities of staff and laboratory.

(6) Science teaching should be linked to agriculture in rural areas and to technology in urban areas. But the levels of attainment and avenues to higher education should be the same in both types of schools.

(7) *The Study of Mathematics.* (a) Special attention should be given to the study of mathematics in view of the importance of qualification and the advent of automation and cybernetics.

(8) The mathematics curriculum needs to be modernized and brought up-to-date at all stages with emphasis on laws and principles of mathematics and logical thinking.

(9) *Methods of Teaching Science and Mathematics.* Methods of teaching mathematics and science should be modernized. stressing the investigatory approach and the understanding of basic principles. Guide materials should be made available to help teachers adopt this approach. Laboratory work will need considerable improvement. There should be flexibility in the curriculum in order to cater to the special needs of the gifted. 8.50-66 (197-200)

95. **Social Studies and Social Sciences.** (1) An effective programme of social studies is essential for the development of good citizenship and emotional integration.

(2) The syllabus should stress the idea of national unity and the unity of man.

(3) The scientific spirit and method of the social sciences should permeate the teaching of social studies at all stages.

8.67-71 (200-201)

96. **Work-Experiecne.** (1) Work-experience should be forward-looking in keeping with the character of the new social order. It will take the form of simple handwork in the lower primary classes, and of craft in the upper primary classes. At the lower secondary stage, it will be in the form of workshop training, and at the higher secondary stage, work-experience will be provided in the school workshop, farm or commercial and industrial establishments.

(2) Where school workshops cannot be provided, suitable kits of tools and materials should be made available at low cost.

(3) The training of teachers, provision of workshops mobilisation of local resources, preparation of literature and the phased introduction of the programme are essential to the success of the scheme.

8.72-78 (201-203)

97. **Social Service.** (1) Programmes of social service and participation in community development should be organized at all levels as suited to the different age-groups, in a phased manner.

(2) Labour and social service camps should be run throughout the year; and for this purpose, a special organization set up in each district. These camps will facilitate the organization of social service programmes in schools. Such programmes may be started as a pilot project in 5 per cent of the districts and extended gradually to the others.

8.79-87 (203-205)

98. **Physical Education.** Physical education is important for the physical fitness and efficiency, mental alertness and the development of certain qualities of character. The programme of physical education, as it is in force today, needs to be re-examined and redesigned in the light of certain basic principles of child growth and development. 8.88-93 (205-206)

99. **Education in Moral and Spiritual Values.** (1) Organized attempt should be made for imparting moral education and inculcating spiritual values in schools through direct and indirect methods with the help of the ethical teachings of great religions.

(2) One or two periods a week should be set aside in the school time-table for instruction in moral and spiritual values. The treatment of the subject should be comprehensive and not divorced from the rest of the curriculum.

8.94-98 (206-207)

100. **Creative Activities.** (1) The Government of India should appoint a committee of experts to survey the present situation of *art education* and explore all possibilities for its extension and systematic development.

(2) Bal Bhawans should be set up in all parts of the country with substantial support from the local community.

(3) Art departments should be set up in selected university centres to carry out research in art education.

(4) A variety of co-curricular activities should be organized to provide pupils opportunity for creative self-expression.

8.99-101 (207)

101. **Differentiation of Curricula for Boys and Girls.** The recommendations of the Hansa Mehta Committee that there should be no differentiation of curricula on the basis of sex is endorsed. Home science should be provided as an optional subject but not made compulsory for girls. Larger provision should be made for music and fine arts; and the study of mathematics and science should be encouraged.

8.102-104 (207-208)

102. **The New Curriculum and Basic Education.** The essential principles of basic education, namely, productive activity, correlation of curriculum with productive activity and the environment, and contact with local community, are so important that they should guide and shape the educational system at all levels, and this is the essence of the proposals made in this report. No single stage of education need be designated as basic education.

8.105-109 (208-209)

CHAPTER IX: TEACHING METHODS, GUIDANCE AND EVALUATION

103. **Teaching Methods: Discovery and Diffusion.** The continual deepening of the curricula should be accompanied by an equally vigorous improvement in the method of teaching and evaluation. The main factors responsible for the dull and uninspiring school teaching today are the rigidity of the educational system and the failure of the administrative machinery to diffuse

new educational practices to schools. These weaknesses should be overcome.

9.02-03 (224-225)

(1) *Elasticity and Dynamism*. A good educational system should be dynamic, flexible and discriminating enough to help institutions and teachers to proceed along different levels of development—the good schools be free to go ahead on creative and experimental lines while the weaker ones should be supported to gain a sense of security.

(2) Such elasticity and dynamism are possible if the experimenting teacher is supported by the administrative authority, a general atmosphere of reform, the encouragement of the head of the institution, a mastery of subject-matter, leadership provided by training institutions, and the availability of teaching materials.

(3) Elasticity in a school system will have little value if new practices developed are not diffused to schools and teachers given skilled help in trying out innovations. The educational administration can encourage and hasten the diffusion of new teaching methods by:

— combining permissiveness with persuasion;

— approaching the new methods in stages according to the ability of schools;

— giving necessary inservice training to teachers;

— providing adequate guide materials which should be constantly revised and improved.

At the same time the administrator has to guard himself against letting any 'progressive' measure settling down into another orthodoxy. 9.04-12 (225-228)

104. **Textbooks, Teachers' Guides and Materials.** (1) Provision of quality textbooks and other teaching-learning materials is a key programme for raising standards at comparatively low cost.

(2) A comprehensive programme of textbook production at the national level should be implemented by mobilising the best talent in the country on the lines already being attempted by NCERT. Such books will facilitate the definition and practical indication of expected standards. They will also help in national integration.

(3) The Ministry of Education should take steps to establish in the public sector, an autonomous organization, functioning on commercial lines for the production of textbooks at the national level, especially scientific and technical books. A small committee may be set up to work out the details of the project.

(4) The effort at the national level should be supported and augmented by each State setting up an expert section for the production of textbooks.

(5) The preparation, try-out and evaluation of textbooks should be the responsibility of the State Education Departments. The production aspect of the textbooks may preferably be done by the State Education Departments, wherever possible, through their own textbook presses. The sale and distribution of textbooks are better left to the student cooperatives and not be assumed directly by the Departments.

(6) The production of textbooks and teaching aids at the State level should preferably be entrusted to an autonomous agency functioning in close liaison with the Education Department.

(7) The machinery set up should be such that the textbooks are subjected to continuous revision and improvement.

(8) At least 3 or 4 books should be provided in each subject to provide a multiple choice of books for the schools.

(9) Liberal policies should be adopted for remunerating authors.

(10) The entire organization of state production of textbooks should be run on a no-profit-no-loss basis.

(11) Manuscripts should be invited from a variety of sources including teachers, and a high-level committee of professional persons should select and approve manuscripts.

(12) Teachers' guides and other instructional material should supplement textbooks.

(13) Lists of minimum teaching aids and equipment needed by each category of schools should be prepared and steps taken to provide the equipment to every school on a high priority basis.

(14) Education Departments should work with the All-India Radio for the use of radio lessons, supplemented by printed guide materials for teachers and pupils. Broadcasting of special radio talks specially designed for teachers in the mornings and

evenings will help teachers in lesson preparation. Sophisticated forms of newer techniques would not be suitable at present in the general run of schools but may be tried out experimentally in teacher training institutions.

(15) Teachers should be helped and trained to rely on inexpensive and locally available or improvised teaching aids. Costly equipment should be shared by schools in a neighbourhood. 9.13-25 (229-233)

105. **Class Size.** (1) Classes of somewhat larger size than what is strictly considered as desirable cannot be avoided in our country for a long time. However, it is necessary to restrict the number of pupils admitted to each class to a maximum of 50 in the lower primary, 45 in the higher primary and lower secondary, and 40 in higher secondary classes. 9.26-31 (233-35)

(2) *Multiple-class Teaching.* Research should be undertaken in the problems and techniques of multiple-class teaching. Training institutions should orient teachers to these techniques. 9.32 (235)

106. **School Buildings.** (1) In view of the present unsatisfactory position regarding school buildings, it is necessary to take steps to clear the backlog of unconstructed school buildings as well as to provide additional buildings for new enrolment. 9.33 (236)

(2) Allocations for construction of school buildings should be increased in the Central and State budgets, and community resources mobilised on the basis of equalization. Loans and grants-in-aid should be given on a liberal basis to private schools for the construction of buildings. 9.34 (236)

(3) *Reduction of Costs.* The norms and guidance already available for spacing and planning of school buildings should be put into practice.

(4) In view of the shortage of traditional building material and the cost involved, well-designed and constructed kacha structures should be accepted as part of the school system. 9.35 (236)

(5) *Buildings in Rural Areas.* In rural areas, efforts should be made to encourage local initiative and contribution in putting up school buildings. The 'nucleus' approach suggested by the Ministry of Education is recommended for general adoption. 9.37 (236)

(6) *Buildings in Urban Areas.* Economy in these buildings should be effected by using locally available materials, omission of certain finishes, and acceptance of a lower standard of construction. Temporary structures may be used wherever possible, and improved techniques of construction may be adopted in putting up pucca buildings. 9.39 (236-37)

(7) *Expeditious Construction.* In order to accelerate provision of school buildings, construction in rural areas may be entrusted to local communities or village panchayats, and in urban areas, municipalities and corporations may be utilized for the purpose.

(8) In order to supervise and guide the programme of construction of school buildings and introduce improved techniques, an Educational Building Development Group should be set up in each State within the Public Works Department and working in close association with the Education Department. These groups will standardise details of construction in the region so as to make possible the mass production of the components on a factory scale. A similar Building Development Group should be set up at the Centre to coordinate the work of the State groups.

(9) To avoid delays in the construction of government buildings, a separate unit of the PWD should be set up for the execution of education building programmes. At a later stage an Education Building Consortia may be set up to exploit the advantages of industrialized buildings.

(10) The economy measures worked out by the Educational Building Development Group should be made known to private institutions and grants-in-aid given on the basis of upper cost limits. 9.40 (237)

107. **Guidance and Counselling.** Guidance and counselling should be regarded as an integral part of education, meant for all students and aimed at assisting the individual to make decisions and adjustments from time to time. 9.43 (238)

(1) *Guidance at the Primary Stage.* Guidance should begin from the lowest class in the primary school and in view of the large numbers of schools involved, the programme may be introduced through simple measures such as (1) familiarising teachers under training with diagnostic testing and the problem of individual differences; (2) organizing in-service courses for primary teachers; (3) producing occupational literature; and (4) helping pupils and

parents in choice of further education. 9.44-45 (238-39)

(2) *Guidance at the Secondary Stage.* Guidance at the secondary stage should, among other things, help in the identification and development of the abilities and interests of adolescent pupils. The ultimate objective should be to introduce adequate guidance services in *all* secondary schools with a trained counsellor in charge of the programme. But in view of the limited financial and personnel resources, a short-range programme should be adopted for the next 20 years consisting of—

(1) a minimum guidance programme for all secondary schools through a visiting school counsellor for a group of ten schools, assisted by the school teachers in the simpler guidance functions;

(2) comprehensive guidance programme in selected schools, one in each district, to serve as models; and

(3) provision of necessary supervisory staff in the State Bureaus of Guidance.

(3) All secondary school teachers should be introduced to guidance concepts through pre- or in-service training. The training colleges should be suitably staffed for the purpose. 9.46-50 (239)

(4) *General.* Arrangements should be made for the professional training of guidance workers by the State Bureaus of Guidance and training colleges. Advanced training should be organized at the national level.

(5) Ancillary programmes should include the production of guidance literature and materials and research into problems of guidance in the Indian situation. 9.51 (240)

108. **Search for and Development of Talent.** (1) The search for talent must be a continuous process, pursued at all stages, but the secondary stage is the most crucial.

(2) In addition to programmes of enrichment and advanced curricula, a variety of extra-mural programmes should be organized for the talented such as summer schools, visits to places of educational interest and provision of hostels and day-centres for those whose home environment is not conducive to study.

(3) Teachers should be oriented to the special techniques of dealing with the talented children, especially to the need for providing an atmosphere for free expression and creative work. 9.52-57 (240-241)

109. **The Backward Child.** Neglect of backward children leads to wastage of educational facilities and human resources and it is necessary for a developing country to reduce this wastage to the minimum. In particular, attention has to be given to the under-achievers who represent a loss of potential manpower often of high ability. Steps should, therefore, be taken to diagnose the causes of under-achievement and to formulate and implement remedial programmes within the school system, with the help of interested teachers and child guidance clinics, where available, and parent-teacher associations. 9.58-64 (241-243)

110. **Evaluation.** Evaluation is continuous process, forms an integral part of the total system of education and is intimately related to educational objectives. It exercises a great influence on the pupil's study habits and the teacher's methods of instruction and thus helps not only to measure educational achievement but also to improve it. (

(1) The new approach to evaluation will attempt to improve the written examination so that it becomes a valid and reliable measure of educational achievement and to devise techniques for measuring those important aspects of the student's growth that cannot be measured by written examinations. 9.65-68 (243-244)

(2) *Evaluation at the Lower Primary Stage.* Evaluation at this stage should help pupils to improve their achievement in the basic skills and development of right habits and attitudes.

(3) It would be desirable to treat Classes I to IV as an ungraded unit to enable children to advance at their own pace. Where this is not feasible, Classes I and II may be treated as one block divided into two groups—one for slow and the other for fast learners. Teachers should be appropriately trained for the ungraded system. 9.69-70 (244)

(4) *Evaluation at the Higher Primary Stage.* In addition to written examinations, weightage should be given at this stage to oral tests as a part of internal assessment. Diagnostic testing should be through simple teacher-made tests. Cumulative record

cards are important in indicating pupils' growth and development but should be very simple and should be introduced in a phased manner. 9.71(244)

(5) *External Examination at the End of the Primary Stage.* Although the first national standard of attainment is to be set at the end of the primary stage, it is not considered necessary or desirable to prescribe a rigid and uniform level of attainment through a compulsory external examination. However, for the proper maintenance of standards, periodic surveys of the level of achievement of primary schools should be conducted by district school authorities through refined tests prepared by State Evaluation Organizations. 9.72-73 (244-245)

(6) *A Common External Examination for Inter-School Comparability.* The district educational authority may arrange for a common examination at the end of the primary stage for schools in the district, using standardised and refined tests. This examination will have greater validity and reliability than the school examination and will provide inter-school comparability of levels of performance.

(7) The certificate at the end of the primary course should be given by the school and should be accompanied by the cumulative record card and the statement of results of the common examination, if any.

(8) In addition to the common examinations, special tests may be held at the end of the primary course for the award of scholarships or certificates of merit and for the purpose of identifying talent. 9.74-76(245)

(9) *Improvement in External Examinations. External examinations should be improved* by raising the technical competence of paper-setters, orienting question papers to objectives other than to acquisition of knowledge, improving the nature of questions, adopting scientific scoring procedures, and mechanising the scoring of scripts and the processing of results. 9.77-79(245-246)

(10) *Certificate given by the Board and School.* The certificate issued by the State Board of School Education on the basis of the results of the external examination should give the candidate's performance in different subjects for which he has appeared and there should be no remark to the effect that he has passed or failed in the whole examination. The candidate should be permitted to appear again, if he so desires, for the entire examination or for separate subjects in order to improve his performance.

(11) The student should receive a certificate also from the school, giving the record of his internal assessment as contained in his cumulative record card and this should be attached to that given by the Board. 9.80-81 (246-247)

(12) *Establishment of Experimental Schools.* A few selected schools should be given the right of assessing their students themselves and holding their own final examination at the end of Class X, which will be regarded as equivalent to the external examination of the State Board of School Education. The State Board of School Education will issue the certificates to the successful candidates of these schools on the recommendation of the schools. A committee set up by the State Board of School Education should develop carefully worked out criteria for the selection of such schools. The schools should be permitted to frame their own curricula, prescribe their own textbooks, and conduct their educational activities without external restrictions. 9.82-83 (247)

(13) *Methods of Internal Assessment.* Internal assessment by schools should be comprehensive and evaluate all aspects of student growth including those not measured by the external examination. It should be descriptive as well as quantified. Written examinations conducted by schools should be improved and teachers trained appropriately. The internal assessment should be shown separately from the external examination marks. 9.84-86 (247-248)

(14) *Higher Secondary Examination.* During the transition period, higher secondary students will have to appear for two successive external examinations— at the end of Classes X and XI, within one year. Where however the courses in Classes IX to XI are integrated, the examination at the end of Class X need not be insisted upon. 9.87-89(248)

CHAPTER X: SCHOOL EDUCATION: ADMINISTRATION AND SUPERVISION

111. A sympathetic and imaginative system of supervision and administration is essential for initiating and accelerating educational reform. 10.01 (249)

112. The Common School System of Public Education. The Common System of Public Education would include all government schools, all local authority schools and all aided private schools. Only two types of schools will remain outside it—independent schools and unrecognized schools.

(1) The objective of educational policy should be to evolve, over the next 20 years, a common school system of public education which would cover all parts of the country, provide equality of access to all children and will maintain such a standard that an average parent will not feel the need to send his child to an independent or unrecognized school.

(2) The following steps will have to be taken to create the common school system of public education:

(a) The existing discrimination between teachers working under different managements should be done away with.

(b) Tuition fees should be abolished in a phased programme—at the primary stage by the end of the fourth plan and at the lower secondary stage by the end of the fifth plan.

(c) The existing discrimination between schools under different managements should be reduced to the minimum and all schools should be provided with the minimum essential conditions necessary for good education.

(d) The neighbourhood school plan should be adopted at the lower primary stage so as to eliminate the segregation between schools for the privileged and schools for the underprivileged.

10.02-06 (249-252)

(3) *Government and Local Authority Schools*. Government and local authority schools do not generally maintain requisite standards because teachers in these schools develop little institutional loyalty and the contact with the local community is either negligible or absent. These weaknesses should be overcome by the folowing measures:

(a) A school committee with local representation should look after the management of every government and local authority school or a group of schools in an area. Each committee will operate its own school fund for the provision of services in schools.

(b) Rational policies of transfers should be formulated so that teachers are not changed too often.

(c) Greater freedom should be given to these schools. 10.07-08 (252-253)

(4) *Private Schools*. It is the responsibility of government to see that private aided institutions are satisfactorily managed through adequate support. Those that are not so managed should be taken over or eliminated.

(5) A discriminating policy needs to be adopted in respect of assistance to and control of private aided institutions. The better schools should be given more freedom and assistance so as to enable them to develop into the nucleus of the common school system.

(6) With the abolition of tuition fees, most private schools will come within the common school system and should be assisted to strengthen their management in the following ways:

(a) Each private school should have a managing committee consisting of representatives of the management, the Education Department and teachers.

(b) The staffing of these schools should be broadly on the pattern of government or local authority schools.

(c) Grant-in-aid should be improved on the basis indicated in the Report.

(7) It should be an invariable rule that educational institutions must be conducted by non-profit-making bodies in order to be eligible for assistance.

(8) Grant-in-aid codes should be amended to authorize the State Education Departments to take over the management of private schools which do not satisfy requirements and which have persistently failed to come up to prescribed standards.

10.08-17 (253-256)

(9) *Good Quality Private Schools*. Good private schools which abolish tuition fees under the common school system should be helped to maintain existing standards and grant-in-aid should be adjusted on the basis of the quality schools as recommended in the Report and not on the basis of the level of the ordinary schools. 10.18 (256)

(10) *The Neighbourhood School.* The present social segregation in schools should be eliminated by the adoption of the neighbourhood school concept at the lower primary stage under which all children in the neighbourhood will be required to attend the school in the locality. This plan should be implemented in a period of 20 years as follows:

(a) During the first ten years, all primary schools should be improved to the minimum level and about 10 per cent of schools should be raised to a higher standard.

(b) Simultaneously the neighbourhood school system should be introduced at the lower primary stage as a pilot project in areas where public opinion is in favour of it.

10.19-20 (256-257)

(11) To encourage children to study in the common school system, scholarships at the school stage given by government and local authorities should be tenable only in a school functioning within the common school system of public education. Similarly, ninety per cent of the scholarships awarded from public funds at the university stage should be open only to those students who have received their secondary education in schools functioning within the common school system. 10.21 (257)

113. **A Nation-Wide Programme of School Improvement. In view of the great need to improve standards of education at the school stage, a nation-wide programme of school improvement should be developed in which conditions will be created for each school to strive continually to achieve the best results of which it is capable.** From this point of view, the following steps should be taken:

(1) Each institution should be treated as a unit by itself and helped to grow at its own individual pace. For this purpose, it should prepare its own developmental programme of optimum utilization and growth.

(2) The emphasis on these plans should be on motivating human agencies to make their best effort for the improvement of education rather than on increasing physical resources. Physical facilities should be improved through the cooperation of the local community.

(3) The success of the programme will depend upon the degree to which the effort is sustained over a period of time.

(4) Evaluative criteria for schools should be worked out by each State and may be used by schools for self-evaluation and by inspecting officers for their annual and triennial inspections. On the basis of these criteria, the schools should be classified on a three-point scale, norms being defined at optimum and minimum levels.

(5) During the next ten years, at least 10 per cent of the schools at the primary stage and one secondary school in each block should be raised to the optimum level. At the lower primary stage, access to these schools will be for the children in the neighbourhood. At the higher primary and secondary stages, admission will be on the basis of merit. 10.24-32 (257-260)

114. **Supervision: Reorganization of the State Department.** (1) The State Education Department will be the principal agency to deal with educational matters and will therefore be responsible for:

- the development and implementation of a programme of school improvement;
- the prescription and enforcement of standards;
- the training and supply of teachers;
- inspection and supervision;
- the establishment and maintenance of a State Evaluation Organization;
- the maintenance of quality institutions and provision of extension services;
- the establishment and maintenance of a State Institute of Education; and
- the coordination and eventual assumption of responsibility for vocational and technical education at the school stage.

10.33 (260-261)

(2) In view of the importance of strengthening the departmental organization at the district level—

(a) the District Education Officer should be given adequate status by including the post in the proposed Indian Educational Service;

(b) adequate authority should be delegated to the district level;

(c) scales of pay and qualifications of inspectoral staff at the district level should be upgraded;

(d) the strength of the district staff should be increased with the addition of 'specialists' and a statistical cell; and

(e) A fair proportion of the district staff should consist of women officers in order to encourage girls' education.

10.34-37 (261-262)

(3) Headmasters should be selected carefully and specially trained. They should be vested with necessary authority and freedom.

10.38 (262-263)

115. **Role of the School Complex in the New Supervision.** (1) The District Education Officer will be in touch with each school complex and as far as possible, deal with it as a unit. The complex itself will perform certain delegated tasks and deal with the individual schools within it. Adequate powers and responsibilities should be delegated to the complex so that better methods of teaching and evaluation are made possible, facilities are shared, in-service training programmes are facilitated and new programmes are tried out.

(2) The scheme should be first introduced in a few selected districts in each State as a pilot project before being implemented on a large scale.

(3) The school complex should not only encourage experimentation *en bloc* but also foster individual experimentation within the unit.

10.39-43 (263-264)

116. **The New Supervision.** Supervision being in a sense the backbone of educational improvement, it is imperative that the system of supervision should be revitalized.

(1) Administration should be separated from supervision, the District School Board dealing with the former and the District Education Officer with the latter. But the two should function in close collaboration.

(2) Recognition should not be a matter of course but should be continuously earned by every school, irrespective of its management.

(3) Every school should have two types of inspections: an annual one by the officers of the District School Board for primary schools and by officers of the State Education Departments for the secondary schools; and a triennial or quinquennial inspection organized by the District Education Officer for the primary schools and by the State Boards of School Education for the secondary schools.

(4) The provision of guidance and extension services to schools is one of the major responsibilities of the new supervision.

(5) In-service training should be provided for all supervisory and administrative officers by State Institutes of Education and the National Staff College for Educational Administrators.

10.44-49 (264-265)

117. **State Institutes of Education.** An academic wing will have to be developed in the State Institutes of Education to look after the in-service training of departmental officers, improvement of teacher education, curricula and textbooks, guidance and evaluation, and research and evaluation of programmes.

10.50-53 (265-266)

118. **State and National Boards of Education.** In order to secure continuous improvement in standards, an adequate machinery should be set up at the State and national levels.

(1) Standards should be defined at the end of the higher primary and lower secondary stages and later on, at the end of the higher secondary stage also when it covers a period of two years.

(2) All these standards should be prescribed by the State Government in the light of local conditions: the State Evaluation Organization and the State Boards of School Education will assist in defining, measuring and periodically revising these standards.

(3) The National Board of School Education will coordinate standards at the national level and help States to raise them continuously.

(4) The national standard will only indicate the minimum below which no State should fall. These minima should be kept rising from time to time.

10.54-58 (267-268)

119. **State Evaluation Organization.** To assist the State Education Department in this programme of prescribing, maintaining and revising standards, a State Evaluation Organization should be set up in each State, as an independent institution, preferably autonomous, and its services should be available to all concerned.

(2) The State Evaluation Organization will assist the District Education Officers in improving evaluation practices in schools, will advise the State Education Departments on curricula geared to expected standards, preparation of textbooks and other materials and measure accomplished standards from time to time.

(3) An Advisory Committee presided over by the Chairman of State Board of School Education will assist the State Evaluation Organization.

10.59-63 (268-269)

120. **State Boards of School Education.** In each State, a State Board of School Education should be established and it should take over the functioning and the responsibilities of the existing Boards of Secondary Education and allied agencies. The Board should be established by law and should have large powers and freedom to enable it to function and discharge its responsibilities satisfactorily. This would be greatly facilitated if its finances are pooled together in a separate fund managed and maintained by the Board. The Board should function as an integral part of the Department.

(1) The Board will be in charge of the entire school stage in respect of curricula. Recognition of primary schools will be given by the District Education Officer and of secondary schools by both the Department and the State Board of School Education.

(2) In addition to conducting the external examination at the end of the lower secondary stage, the Board will also conduct examinations in general education at the end of the higher secondary stage.

(3) In the long run, it would be desirable to bring all school education—general and vocational—within the scope of a single organization like the State Board of School Education. But this step may not be immediately practicable. Therefore, separate organizations may be set up, for the time being, for different vocational courses at the State level. There should, however, be a close coordination between these bodies and the State Board of School Education, and there should be overlapping membership to some extent.

(4) A special committee of the Board should be established to look after the higher secondary stage. Half of its members should represent the schools and the other half, the universities.

(5) The time taken for the declaration of examination results should be minimised by (1) mechanising the procedures, and (2) setting up sub-Boards to cover one or more districts in order to handle smaller numbers of candidates.

10.64-69 (269-270)

121. **Role of the Centre.** (1) A National Board of School Education should be established in the Ministry of Education to advise the Government of India on all matters relating to school education. It will define expected standards at different stages of education, revise these standards from time to time, evaluate standards attained in different parts of the country, and advise and assist State Education Departments in curricular reform and in improving standards. It will maintain close collaboration with the UGC and the universities.

(2) A large programme should be developed in the centrally sponsored sector for the devlopment of school education, particularly in respect of the establishment of vocational institutions, developing quality institutions and provision of scholarships.

(3) The Central Board of Secondary Education should conduct some high standard examinations in individual school subjects at two levels—Classes X and XII—in consultation with the National Board of School Education. Curricula for these examinations should be prescribed in relation to the national standards. A beginning may be made with mathematics and science subjects. It should be open to the student of any recognized secondary school in the country to appear at these examinations and he should be awarded a certificate about his performance therein, separately for each subject. Such examinations would help in raising standards.

10.70-76 (270-272)

122. **Unrecognized Schools.** It may be desirable to introduce legislation for the compulsory registration of all educational institutions and it should be made an offence to conduct an unregistered institution. Power should also be vested in the State Government to remove any educational institution from the register if stipulated conditions are not fulfilled.

10.80 (273)

CHAPTER XI: HIGHER EDUCATION OBJECTIVES AND IMPROVEMENT

123. **Objectives of Universities.** In broad terms, the functions of the universities in

the modern world may be said to be the following.

- to seek and cultivate new knowledge, to engage vigorously and fearlessly in the pursuit of truth, and to interpret old knowledge and beliefs in the light of new needs and discoveries;
- to provide the right kind of leadership in all walks of life, to identify gifted youth and help them develop their potential to the full by cultivating physical fitness, developing the powers of the mind and cultivating right interests, attitudes and moral and intellectual values;
- to provide society with competent men and women trained in agriculture, arts, medicine, science and technology and various other professions, who will also be cultivated individuals, imbued with a sense of social purpose;
- to strive to promote equality and social justice and to reduce social and cultural differences through diffusion of education; and
- to foster in the teachers and students, and through them in society generally, the attitudes and values needed for developing the 'good life' in individuals and society.

11.02 (274-275)

124. In addition to these broad functions which they share in common with all universities, Indian universities will have to shoulder some special responsibilities in the present state of our social and educational development. For instance,

- they must learn to serve as the conscience of the nation; and from this point of view, they should encourage individuality, variety and dissent, within a climate of tolerance;
- they should develop programmes of adult education in a big way and to that end, evolve a widespread net-work of part-time and correspondence courses;
- they should assist the schools in their attempts at qualitative self-improvement;
- they should shake off the heavy load of their early tradition which gives a prominent place to examinations and strive to improve standards all-round by a symbiotic development of teaching and research; and
- they should create at least a few centres which would be comparable to those of their type in any other part of the world and thus help to bring back the 'centre of gravity' of Indian academic life within the country itself.

11.04-10 (275-277)

125. If these objectives are to be realised, we need a well-conceived and comprehensive plan for the devlopment of higher education, spread over the next twenty years, which will include, among other things, the following three programmes of high priority:

- A radical improvement in the quality and standards of higher education and research;
- Expansion of higher education to meet the manpower needs of national development and, to some extent, the rising social ambitions and expectations of the people; and
- Improvement of university organization and administration.

11.11 (277-278)

126. **Major Universities.** The most important reform in higher education is the development of some 'major universities' where first-class postgraduate work and research would be possible and whose standards would be comparable to the best institutions of their type in any part of the world. The UGC should select, as soon as possible, from amongst the existing universities, about six universities (including one of the IITs and one Agricultural University) for development as major universities. The programme should begin in 1966-67.

127. A major university should have a 'critical mass' of students and teachers of outstanding capacity and promise. From this point of view,

(1) each major university should be assigned a number of scholarships for the undergraduate stage which will provide it with enough talented students for its postgraduate classes. Of these scholarships, about half should be from outside the area of the university.

(2) each department or faculty of a major university should have a specially appointed personnel advisory committee, which should work in close collaboration

with the appointing authorities of the university. The search for staff, instead of being limited to the State or the region, should be made nation-wide and, in a sense, world-wide. Where necessary, the selected candidates should be offered advance increments. What is even more important, they should be assured of research opportunities, opportunities for study leave and the possibility to achieve professional excellence. There should be room for flexibility in the appointments and promotions. The UGC should place at the disposal of each university a contingency fund which may be used to provide more attractive salaries to persons of exceptional promise and performance.

128. It is necessary to establish 'clusters' of advanced centres in the major universities. They will add strength to, and enrich one another and be specially helpful in promoting inter-disciplinary research. About fifty such centres should be established, including some in modern Indian languages over the next five to ten years. At least one of them should concentrate on developing an inter-disciplinary approach to education. Other important areas to be covered are agriculture, engineering and medicine.

129. (1) The administration of a centre, subject to the overall supervision of the university's Executive Council, should be the responsibility of its director assisted by a small but representative committee of his colleagues.

(2) The original selection of a university department as a centre should be made on the basis of the quality and extent of work already done by it, its reputation for good teaching, its contribution to research and its potentiality for further development. The process of selection should be so devised that it will win the confidence of the universities and the academic community generally.

(3) The privilege of being a centre of advanced study should be continually earned and deserved. Each centre of advanced study should have, say, once in three to five years, a visiting committee, consisting of outstanding Indian and, where possible and necessary, foreign experts who will conduct a review and appraisal of the accomplishments of the centre.

(4) The centres within a university should function in close collaboration with other centres and departments which are not centres of advanced study and measures should be adopted to involve the entire staff of the university in functioning as an intellectually effective community.

(5) The major universities should constantly strive to enlarge the area of their excellence. For this purpose, they might be given a grant in proportion to the number of centres they already possess, to be used for the purpose of raising other departments within the university to their level.

(6) Centres for advanced study should seek to bring the relevant teachers of their affiliated colleges into closer contact with their work.

130. The recurring and capital costs of the major universities should be met by the UGC.

11.17—35 (279-284)

131. **Improvement of Other Universities.** The major universities should be utilized to provide teachers of quality to the other universities and to the affiliated colleges. From this point of view,

(1) every effort should be made to induce talented students from the major universities to join the teaching profession and to place a majority of them in universities and colleges, other than their own, so that they can help to raise standards.

(2) the UGC should sponsor a scheme for instituting a number of fellowships at three levels—lecturers, readers and professors. Outstanding persons, who may otherwise be lost to the profession, should be granted these fellowships and seconded to work in suitable departments of universities, care being taken to see that they are appointed against permanent posts as early as possible.

(3) The universities and affiliated colleges should be encouraged, so far as possible, to pre-select their new teachers and attach them to the major universities for a specified period.

(4) Strong inter-university links should be formed among members of centres of advanced study, members of aspirant centres, leading university departments and outstanding affiliated colleges, in particular fields of research.

(5) Invitations may be given to promising scholars and scientists from other universities or affiliated colleges to do research and to conduct seminars (say for a term or

a session) at one of the centres of advanced study.

(6) The other universities should be helped, through concentration of resources, to develop excellence in selected departments and ultimately to raise them to the level of Centres of Advanced Studies.

11.36-39 (284-285)

132. **Development of Affiliated Colleges.** There are several colleges of long-standing which have done and are doing as good work as any good university and it should be an objective of educational policy to encourage them. The following steps may be taken to assist in this process:

(1) Affiliated colleges should be classified in terms of the level of their performance and assistance should be related to such classification.

(2) Where there is an outstanding college (or a small cluster of very good colleges) within a large university which has shown the capacity to improve itself markedly, consideration should be given to granting it an 'autonomous' status. This would involve the power to frame its own rules of admissions, to prescribe its courses of study, to conduct examinations and so on. The parent university's role will be one of general supervision and the actual conferment of the degree. The provision for the recognition of such autonomous colleges should be made in the constitution of the universities. It should be possible, by the end of the fourth five year plan, to bring at least fifty of the best colleges under this category. 11.40-41 (285-286)

133. **Improvement of Teaching and Evaluation.** (1) The number of formal classroom and laboratory hours should be somewhat reduced. The time thus saved should be devoted, under the guidance of instructors, to independent study, assigned reading, writing of essays, solving of probelms and small research projects in which the student seeks out and learns to use independently the books and documents he needs.

(2) Every effort should be made to build up good libraries in universities and colleges.

(3) It is most important to emphasize original thinking in the study of all subjects and to discourage memorizing.

(4) There should be a possibility of undergraduates coming into occasional contact with senior and outstanding teachers, particularly when a new subject has to be introduced for the first time.

(5) The content and quality of lectures in general needs to be considerably improved. One way of characterizing the level of class work is that every one hour of instruction should receive about 3-4 hours of study-time to digest the lectures.

(6) It may be laid down as a rule that no teacher should be away from his institution during 'term time' for more than seven days in a year.

(7) All new appointments should be made during vacation time so that teachers join their new posts at the beginning of the academic year. Further, unless there be compelling reasons, no teacher should be permitted to leave an institution to take up another appointment during term time.

(8) There is great need for experimentation, especially in two important areas. One such area concerns the manner of handling larger numbers of students without a proportionate increase in educational expenditure or the number of faculty members. Another desirable experiment would be to have a certain amount of teaching done by research students and by selected postgraduate students after their first year.

(9) The problem of teaching methods in higher education has been relatively neglected. It should be examined by the UGC through a special committee appointed for the purpose. The schools of education should make a special study of the teaching methods, not only at the school stage, but also in the universities and affiliated colleges.

(10) In all teaching universities, external examinations should be replaced by a system of internal and continuous evaluation by the teachers themselves.

(11) In universities with affiliated colleges, a system of internal assessment should supplement the external examination.

(12) The University Grants Commission should set up a Central Examination Reform Unit to work in collaboration with the universities. Special units for examination reform should also be set up in some universities who can be persuaded to organize examination reform in a big way.

(13) University teachers should be re-oriented to adopt the new and improved techniques of evaluation through a large programme of seminars, discussions or workshops.

(14) Early measures should be taken to abolish payment of remuneration to examiners. As a first step, the total number of scripts to be examined by any teacher during a year should not exceed 500.

11.42-57 (286-291)

134. **Medium of Education.** (1) The regional languages should be adopted as media of education at the university stage in a phased programme spread over ten years.

(2) At the earlier stage of the undergraduate course, the bulk of the instruction may be given through the regional language while at the postgraduate stage, it may be in English.

(3) In due course, all teachers in higher education should, as far as possible, be bilingual and postgraduate students should be able to follow lectures and use reading materials in the regional language as well as in English.

(4) The maintenance of colleges teaching through the medium of Hindi in the non-Hindi areas or of Urdu in any part of the country where there is a resasonable number of Urdu-speaking students, should be permitted and encouraged.

(5) Centres of advanced study should be established for the development of all modern Indian languages including Urdu.

(6) The classical and modern Indian languages should be provided as elective subjects, no language being made a compulsory subject of study at the university stage.

(7) Adequate facilities should be provided in universities and colleges for the study of English. Special units for teaching English should be established in universities to give a good working knowledge of it to new entrants by the adoption of modern teaching techniques. It would also be an advantage to teach some English as part of the elective subject course in the first year of the degree course.

(8) The teaching of important library languages other than English should be stressed, in particular the study of Russian, on a larger scale. 11.58-61 (291-293)

135. **Student Services.** Student services are not merely a welfare activity but constitute an integral part of education. These should include orientation for new students, health services, residential facilities, guidance and counselling including vocational placement, student activities and financial aid.

(1) All institutions of higher education should organize orientation programmes for new students in the beginning of the academic year to facilitate adjustment. Each student should be assigned to an academic adviser who would assist him in planning and organizing his programme and studies Every member of the teaching faculty should be expected to serve as an academic adviser to a group of students.

(2) Steps should be taken to organize, on a high priority basis, adequate health services in universities and colleges. Adequate provision should also be made for health education of students. The UGC may explore the possibility of organizing health services for university teachers and students on the lines of the Contributory Health Services of the Government of India.

(3) Hostel accommodation should be provided, as soon as possible, for about 25 per cent and 50 per cent of the enrolment at the undergraduate and postgraduate stages respectively.

(4) Day-study Centres, with subsidized or low-cost cafetarias, should be provided for about 25 per cent of the non-resident students.

(5) There should be at least one counsellor for every thousand students. A project for the training counsellors should also be organized in some university. A combined information and employment centre should function directly under the supervision of the dean of students in each university.

(6) It is necessary to develop a rich and varied programme of co-curricular activities for students not only during term-time but also during vacations.

(7) There should be a full-time dean of student welfare for the administration of welfare services. 11.62-72 (293-295)

136. **Student Unions.** (1) Each university should decide how its student union will function, as experimentation in this matter is welcome.

(2) Membership of the student union should be automatic, but every student

should be expected to choose at least one activity organized in the union.

(3) The office-bearers should be elected indirectly by the different student societies in the university, those who spend two or more years in the same class being disqualified for the purpose.

(4) Joint Committees of teachers and students should be established and fully utilized to ascertain and redress the genuine difficulties of students.

(5) The UGC should take initiative in convening and financially supporting an annual conference of representatives of the student unions in universities and colleges. 11.73-76 (295-296)

137. **Student Discipline.** (1) Education should enable young men and women to learn and practise civilized forms of behaviour and to commit themselves to special values of significance.

(2) The responsibility for indiscipline taking place is multi-lateral and no effective solution is possible unless each agency—students, parents, teachers, State Governments and political parties—does its own duty.

(3) Earnest efforts should be made to remove the educational deficiencies that contribute to student unrest and set up an adequate consultative and administrative machinery to prevent the occurrence of acts of indiscipline.

(4) The incentives to positive discipline have to come from opportunities that the institution presents to the intellectual and social demands it makes on the students. A better standard of student services is also necessary.

(5) The whole university life should be treated as one and polarization between teachers, students and administration should be avoided. 11.77-80 (296-297)

CHAPTER XII: HIGHER EDUCATION: ENROLMENT AND PROGRAMMES

138. **Expansion of Facilities.** The expansion of facilities in higher education should be planned broadly in relation to manpower needs and employment opportunities. On the basis of the present trends, it appears that the enrolments in undergraduate and postgraduate courses will have to be increased from about 1 million in 1965-66 to 4 million in 1985-86. Facilities in professional courses such as agriculture, engineering or medicine and those at the postgraduate stage will have to be specially expanded. 12.02-09 (299-305)

139. **Selective Admission.** Since the demand for higher education will be much larger than the provision that can be made for it or is needed on the basis of manpower needs, a system of selective admissions will have to be adopted. Three measures would have to be adopted from this point of view:

- — the determination of the number of places available in an institution in relation to teachers and facilities available to ensure that standards are maintained at an adequate level;
- — prescription of eligibility by the universities; and
- — selection by the institution concerned of the best students from amongst those who are eligible and seek admission.

(1) While the use of examination marks as a major basis for admissions may continue until better selection methods are devised, their arbitrariness or lack of reliability should be compensated, to the extent possible, by making due allowance for the socio-economic handicaps of students so as to relate selection more directly to innate talent. The final selection should also take into consideration such factors as the school record and the proficiency of the student in fields not tested in the examination. This is especially important in border-line cases. In exceptional cases, the universities should have the right and courage to suspend the rules and give admissions to students whose talent has been identified but who may not have been able to fulfil the entrance requirements. The procedure proposed for selecting students on the basis of 'school clusters' for the award of scholarships may also be adopted for making admissions to quality institutions.

(2) Each university should constitute a Board of University Admissions to advise the university about all matters relating to admissions.

(3) The University Grants Commission should set up a Central Testing Organization for the development of appropriate selection procedures for different courses of higher education. 12.10-20 (305-308)

140. **Part-time Education.** Opportunities for part-time education (correspondence

courses, evening colleges) should be extended widely and should include courses in science and technology. By 1986, about a third of the total enrolment in higher education could be provided through a system of correspondence courses and evening colleges. 12.21-22 (308-309)

141. **College Size.** The general policy should be to encourage the establishment of bigger institutions which tend to be more efficient and economic. A college should normally have a minimum enrolment of 500 and it would be preferable to raise it to 1,000 or more in as many colleges as possible. From this point of view,

(1) the UGC should undertake a study of the planning of the location of colleges with special reference to small colleges.

(2) in granting affiliation to colleges, the universities should emphasize the expansion of existing colleges, rather than establishing new ones.

(3) In granting affiliation to a new college, care should be taken to see that its location is so planned that it does not interfere with a proper growth of an existing institution of its own. 12.23-26 (309-310)

142. **Postgraduate Education and Research.** Postgraduate education and research work should ordinarily be organized in the universities or in university 'centres' where a good programme can be developed co-operatively by a group of local colleges. The increase in enrolments at the postgraduate stage should always be contingent on adequate increase in material and staff resources. A rigorous test of admission should be introduced and adequate scholarships should be available (to cover 50 per cent of the students) and these should be supplemented by loan scholarships. The Government of India should be made almost exclusively responsible for postgraduate education and research. 12.27-31 (310-313)

143. **Education of Women.** (1) At present, the proportion of women students to men students in higher education is 1:4. This should be increased to about 1:3 to meet the requirements for educated women in different fields. For this purpose, a programme of scholarships and provision of suitable but economical hostel accommodation should be developed.

(2) At the undergraduate stage, separate colleges for women may be established if there is a local demand. At the postgraduate level, however, there is no justification for separate institutions.

(3) Women students should have free access to courses in arts, humanities, sciences and technology. Courses in home science, nursing, education and social work need to be developed as these have attraction for a large proportion of girls. Facilities for advanced training in business administration and management should also be provided.

(4) Research units should be set up in one or two universities to deal specifically with women's education. 12.32-34 (313-314)

144. **New Universities.** The establishment of new universities is inescapable. The metropolitan cities of Bombay, Calcutta, Delhi and Madras should have, by the end of the fourth plan, two universities each which would supplement to some extent the work of each other. The demand from the States of Kerala and Orissa for additional universities is justifiable. The proposals for the establishment of a university for the hill areas of the North-Eastern Region should be supported as a major measure for spearheading economic and social development in the area.

145. In establishing new universities, the following principles should be kept in view:

(1) The establishment of a new university can be justified only if it leads to a substantial improvement in standards and in the output and level of research.

(2) No new university should be started unless the agreement of the UGC is obtained and adequate provision of funds is made.

(3) Co-operative effort by postgraduate centres to provide facilities for postgraduate education should be developed as a first step towards the establishment of a university. A new university should not ordinarily be established in a place where a university centre has not been in operation for some time.

(4) Good university organization would be one in which a university has a strong core of teaching departments combined with about 30 affiliated colleges in close proximity.

(5) The UGC may explore the possibility of bringing together all universities in a State in a 'consortium' to operate all the affiliated colleges in the State.

(6) A time of two to three years should be allowed to elapse between the appointment of the first vice-chancellor and the direct commencement of the university's work, the vice-chancellor being assisted by a Planning Board during the period.

(7) Larger resources should be placed at the disposal of the UGC so as to increase the amount of Central assistance to all State universities on the basis of their performance and merit. 12.35-43 (314-317)

146. **Calcutta University.** The State Government in consultation with the UGC and the Government of India may have the affairs of the University of Calcutta examinted with a view to finding a way out of the difficulties created by a rapidly increasing undergraduate population. 12.36 (315)

147. **Inter-University Collaboration.** Universities should join together, at the regional and national levels, in cooperative programmes and supplement mutually their available facilities, especially in research. It should be the special responsibility of the UGC to promote collaborative and cooperative programmes which cut across state, regional or linguistic frontiers. 12.39 (316)

148. **Reorganization of Courses.** (1) The combination of subjects permissible for the first degree should also be more elastic than at present, both in the arts and in the sciences. It should not be linked too rigidly to the subjects studied at school.

(2) There should be general, special and honours courses at the undergraduate stage. Universities which have better facilities should only provide for special courses or for general (honours) courses. Affiliated colleges should have an option to provide either the general courses—both at the pass and honours level—or the special courses, minimum enrolment being prescribed for the general (honours) and special courses to economize on costs.

(3) It is an urgent need to introduce flexibility and innovation in the organization of the courses for the Master's degree. The curricula should be framed as to provide a general broad-based course or intensive training in one or two special fields.

(4) A student should be expected to work from two to three years for a Ph.D degree which should be regarded as the beginning and not the climax of the research career of the student. During the first year of the Ph.D. course, students should attend lectures and tutorials of an advance nature to overcome inadequacy of preparation at the Master's Degree stage.

(5) Students for the Ph.D. courses should be carefully selected, a time-limit being set within which a student is expected to submit his thesis. There should also be a limit on the number of students to be guided by a teacher at any given time.

(6) The procedure for evaluation of the Ph.D. degree should be improved, a defence of the thesis being considered an essential requirement for the degree.

(7) A study of a second world language should be obligatory for all Ph.D. students and compulsory for the Master's degree in certain subjects.

(8) It would be desirable to institute the degree of Doctor of Science as the highest award given on the basis of recognized research work.

(9) Special efforts should be made to promote inter-disciplinary studies in universities which have adequately staffed departments in related subjects. To further this objective, a broad-based staffing pattern is also needed. 12.44-51 (317-320)

149. **The Social Sciences.** The social sciences should be given a significant position in Indian universities and research institutions. From this point of view:

- there should be adequate provision of scholarships in the social science courses;
- the choice of subjects at the first degree stage should be elastic and it should be possible for students to combine study of a social science with any other group of subjects;
- the financial assistance available to universities for the development of social sciences should be considerably increased; and
- high level schools or Centres of Advanced Study for allied groups of social sciences should be developed in a number of universities.

12.52-56 (320-321)

150. **Area Studies.** It should be our endeavour to develop a significant and effective programme of area studies in a few selected universities and institutions. Such a programme would require intensive courses in the languages of the areas concerned, and the introduction of optional

groups of papers in certain social science subjects having reference to the different areas selected for intensive study. Close inter-disciplinary collaboration would also be necessary. 12.57(321)

151. **Study of Humanities.** The need for strengthening the humanities cannot be overstressed. In science education, we shall have to depend inevitably on developments in advanced countries with which we will not be able to catch up in the foreseeable future. To redress the balance, our scholars should strive to make significant contributions to the sum total of human knowledge and experience in the fields of the social and pedagogical sciences and humanistic studies, where our old traditions and the present challenges posed by social development present unique opportunities for creative work. 12.58-59 (322)

152. **Educational Research.** Urgent steps have to be taken to develop educational research and relate it effectively to the formulation of educational policies and improvement of education. From this point of view, the following programmes need to be developed.

(1) A documentation centre and a national clearing house in educational research should be developed at the NCERT.

(2) Educational research has to be developed in teams and in inter-disciplinary fields. While all training colleges should do some research, the restriction of educational research to training colleges has hampered its growth. It will be the special responsibility of Schools of Education to develop educational research in a big way in collaboration with other departments.

(3) It is desirable to set up a National Academy of Education consisting of eminent educationists, broadly on the lines of the National Institute of Science, to promote educational thought and research. This should essentially be a non-official, professional body. But it should receive adequate financial support from the Government of India.

(4) An Education Research Council should be set up in the Ministry of Education for the promotion of research.

(5) There is urgent need to provide good specialized training for research work and services for data-processing, statistical analysis and consultation.

(6) It would be the responsibility of the NCERT at the national level and the State Institutes of Education at the State level to bridge the serious gap between the educational research and current school practices. A similar role will have to be played by the UGC in the field of higher education.

(7) The total expenditure on educational research has to be increased considerably, the goal being to devote about one per cent of the State expenditure on education to it. 12.60-65 (322-324)

CHAPTER XIII: THE GOVERNANCE OF UNIVERSITIES

153. Universities should evolve dynamic techniques of management and organization suited to their special functions and purposes. The UGC should encourage the formation of groups in universities to study the problem of educational administration and management of university affairs. 13.02 (325-326)

154. **University Autonomy.** The proper sphere of university autonomy lies in the selection of students, the appointment and promotion of teachers and the determination of courses of study, methods of teaching and the selection of areas and problems of research. 13.05(326)

155. **Autonomy within a University.** (1) The representation of the non-academic element on university bodies should be mainly for the purpose of presenting the wider interests of society as a whole to the university but not to impose them.

(2) The universities should give considerable autonomy to their departments. The principle that good ideas often originate at the lower levels must be recognized and respected in the governance of a university. Wider administrative and financial powers should be delegated to a Committee of Management to be set up in each Department under the chairmanship of the head of the department.

(3) The freedom and autonomy of colleges must be recognized and respected in the same spirit as the university wants it for itself.

(4) There should be joint committees of teachers and students in each department and in every college, and a central committee under the chairmanship of the head

of the institution for the discussion of common problems and difficulties. Student representatives should also be associated with the Academic Councils and the Courts of Universities. 13.09 (327-328)

156. In India, the tradition of university autonomy is fairly strong and will have to be consolidated in time. This imposes special responsibilities on Government, UGC, IUB, the public and the universities themselves. In particular, the following need emphasis:

(1) A suitable machinery for consultations between universities, the UGC, IUB and the Government should be developed for reaching decisions regarding number of students to be trained, courses of study and problems of applied research.

(2) The UGC, the IUB and the intelligentsia have an important role to play in creating a strong public opinion in favour of university autonomy.

(3) The universities have to continually earn and deserve their autonomy by discharging their intellectual and public obligations effectively. 13.10-15 (328-330)

157. **University Finances.** (1) The State Governments should place adequate financial resources at the disposal of universities and simplify rules and procedures for operating them.

(2) The UGC should be enabled to give both development and maintenance grants to State Universities.

(3) There should be some reasonable sharing of developmental expenditure on universities between the UGC and State Governments.

(4) UGC should take steps to resolve problems faced by some universities on account of the non-payment of grants on committed expenditure by State Governments.

(5) The system of grant-in-aid from the State Governments to the universities should be reorganized on the basis of a suitable system of block grants.

(6) The finance of universities should be placed on a sound footing on the basis of advice given by the UGC to the State Governments and the universities after periodical review.

(7) Universities should be immune from *direct* governmental intervention and also from *direct* public accountability.
13.16-31 (330-334)

158. **Role and Appointment of the Vice-chancellors.** (1) While the choice of the vice-chancellor should eventually be left to the university concerned, for the time being, the present 'Delhi' pattern, or some variation of it may be adopted. The members of the Selection Committee for the vice-chancellor should be known for their eminence and integrity and there should be no objection to one of them being connected with the university but he should not be a paid employee of the university.

(2) The authority to appoint the vice-chancellor during the first years of a university's life should vest in the Visitor/Chancellor.

(3) The vice-chancellor should, as a rule, be a distinguished educationist or eminent scholar with adequate administrative experience.

(4) The term of office of the vice-chancellor should be five years and he should not be appointed for more than two terms in the same university.

(5) All posts of vice-chancellors should be whole-time and carry a salary.

(6) The retirement age for the vice-chancellor should be 65 years, an exception being made in the case of exceptionally qualified persons of all-India eminence.

(7) It would be an advantage if the sucessor to a vice-chancellor could be designated, so far as possible, in advance by a year or so.

(8) Adequate powers should be vested in the vice-chancellor for the efficient working of the university. 13.32-40 (334-336)

159. **Legislation for Universities.** (1) The Court should be the policy making body of the university with a membership of not more than 100, of which about half should be external.

(2) The Executive Council with the vice-chancellor as chairman should consist of 15—20 members, about half being internal and half erternal.

(3) The Academic Council should be the sole authority for determining the courses of study and standards.

(4) A standing committee of the Academic Council should deal with urgent matters, if the Academic Council cannot meet frequently enough for the purpose.

(5) Each university should have an Academic Planning Board for permanent planning and evaluation, detached from day-to-day administration.

(6) The IUB should appoint a committee to go into the question of reform of ritual and procedure of convocation functions.

(7) The Governors of the States should be the Visitors of all universities in the State and should have power to direct inspection or inquiry into the affairs of a university.

(8) The Ministry of Education and the UGC should take the initiative to revise existing university legislation in India and to amend it in the light of the recommendations made.

(9) The constitution of a university should be formulated in sufficiently general terms so as to leave room for, and promote, innovation and experimentation.

(10) A suitable machinery for tripartite consultations between the UGC, the Ministry of Education and the State Governments should be evolved before legislation relating to universities is enacted.

13.41-48 (336-338)

160. **Universities and the Law Courts.** The Government of India may request the Supreme Court to frame a suitable policy to help the maintenance of university autonomy and the proper development of higher education. 13.49-51 (338-339)

161. **Affiliated Colleges.** (1) Affiliation of colleges should be granted by the universities after consultations with the State Government have been made.

(2) A committee of vice-chancellors in the State should be set up to advise the Education Department regarding the grant-in-aid to affiliated colleges.

(3) There should be a Council of Affiliated Colleges in every affiliating university to advise the university on all matters relating to affiliation of colleges.

(4) The existing machinery for the grant of affiliation to colleges and for their periodical inspection should be strengthened.

(5) Affiliation should be regarded as a privilege which is to be continually earned and deserved.

(6) The UGC may examine the question of a small nucleus staff being sanctioned to each affiliating university for the proper organization of an inspection programme.

(7) The most important reform which alone will make it possible to improve affiliated colleges is to relate enrolments to the facilities available. 13.52-60 (339-342)

162. **Government Colleges.** (1) Different approaches to suit local conditions and traditions may be devised for the management of Government colleges, *e.g.*, the establishment of a separate Directorate of Collegiate Education, or an autonomous organization for all Government colleges in a State, or placing each college under an autonomous Board of Governors.

13.57-58 (340-341)

163. **Private Colleges.** (1) A discriminating policy should be adopted so that greater freedom and assistance to the really good private institutions could be given.

(2) The procedure for calculation and payment of grants-in-aid should be simplified on the lines recommended.

13.59-60 (341-342)

164. **The Inter-University Board.** (1) All statutory or deemed universities should become members of the IUB automatically.

(2) The degree or diplomas granted by a statutory or deemed university in India should receive automatic recognition from all the other statutory or deemed universities.

(3) The IUB should be strengthened financially to enable it to develop advisory, research and service functions for and on behalf of the universities.

13.62-66 (342-343)

165. **The University Grants Commission.** (1) All higher education should be regarded as an integrated whole and the UGC should eventually represent the entire spectrum of higher education. For the time being, however, it would be more feasible to set up separate UGC-type organizations for agricultural, engineering and medical education and to create a machinery that would effectively coordinate them.

(2) The UGC should consist of 12—15 members; not more than one-third should be

officials of government and at least one-third from the universities. There should be no objection to a serving vice-chancellor being appointed as a member of the UGC.

(3) The UGC should adopt a practice of working through standing committees set up to deal with important responsibilities entrusted to it.

(4) The visiting committees appointed by the UGC should visit each university every three years and work in greater detail and depth.

(5) Considerably larger funds should be available to the UGC to enable it to deal effectively with the magnitude and importance of the problems and responsibilities as envisaged.

(6) The responsibility of coordinating standards should continue to vest in one ody, *viz.*, the UGC. State UGCs should not, therefore, be created.

13.67-76(343-345)

Chapter XIV: Education for Agriculture

166. A programme of education for agriculture will have to be based on an effective organic link between the three main elements of teaching, research and extension.
14.01-06 (348-349)

167. **Agricultural Universities.** At least one agricultural university should be established in each State.

(1) Beginning with traditional agricultural specialities, these universities should gradually extend their scope of studies to cover a wide range of specialized courses to suit the needs of the day.

(2) A clear delineation of responsibilities between Agricultural Universities and the State Departments of Agriculture is necessary. The former should take over all research, education and extension programmes.

(3) Postgraduate work should become a distinctive feature of the Agricultural Universities which should be staffed with adequately trained personnel. The intake at the postgraduate level, particularly in the hitherto neglected areas, will have to be considerably increased. To ensure maintenance of standards, however, this expansion should be related to available personnel and facilities and no institution should be allowed to undertake postgraduate instruction unless it has adequate, integrated facilities for education and research.

(4) Central Research Institutes like the Indian Agricultural Research Institute (IARI) and the Indian Veterinary Research Institute (IVRI) and the National Dairy Research Institute (NDRI) and the Agricultural Universities would constitute suitable centres for strong postgraduate schools in agriculture. Close coordination among these institutions on the one hand and with ICAR on the other should be established.

(5) Admission to postgraduate courses should not be restricted to agricultural graduates only. Talent from as many fields as possible should be harnessed to the betterment of agricultural research and education.

(6) To enable the students to undertake independent study and to ensure their introduction to research as early as possible, each university should have a well-equipped library with adequate staff.

(7) Coordinated, problem-and-production oriented research projects recently evolved by the ICAR should be developed further.

(8) Duration of first degree course should ordinarily be five years, after ten years' schooling.

(9) *Teachers.* For as many of the staff members as possible, there should be integrated assignments between classroom teaching and laboratory research, experimental research and work in the field with rural people.

(10) The UGC scales of pay should be extended to Agricultural Universities also. Other conditions of service should be made attractive.

(11) The strength of any faculty should be determined by needs and quality of staff and not by any rigid hierarchy. Merit should be the main consideration for promotion within a faculty.

(12) The faculties should have reasonable academic freedom.

(13) External examinations should be reduced in importance and abolished as early as possible.

(14) A large scale programme of teacher training should be undertaken immediately in 5 or 6 existing high quality centres, offering attractive scholarships to graduates in science and agriculture.

(15) ***Students.*** Scholarships awarded should cover not less than 25 per cent of the students in Agricultural Universities.

(16) To attract talented students the present scales of pay offered to agricultural graduates should be improved.

(17) *Farm.* Well-managed farms, about 1,000 acres in size and with not less thon 500 acres of cultivated area, should be attached to every agricultural university.

(18) *Internship.* Possibilities of providing one year internship on a well-managed State university demonstration farm before awarding the degree to the students should be explored.

(19) *Number, Size and Organization.* In the process of establishing one agricultural university in each State, the possibilities of converting existing universities into agricultural universities should also be studied.

(20) While some experimentation should be allowed, it is essential that all agricultural universities should conform to some important principles such as, being single campus universities without any affiliated colleges. If for any exceptional reasons, the university should take over the responsibility for colleges outside its campus, they should be made constituent colleges under a unified administration. 14.07-34 (349-356)

168. **Contribution of other Universities for the Development of Agriculture.** (1) Other universities wishing to introduce agricultural studies should be given all assistance.

(2) An academic relationship between some of the agricultural universities and the IITs should be developed. This can take the form, among other things, of an exchange of students and staff, and arranging common programmes of study and research.

(3) The possibility of organizing agricultural faculties in one or two of the IITs and in some leading universities should be explored. 14.35 (356-357)

169. **Agricultural Colleges.** (1) New agricultural colleges should not be established and the training of undergraduates and postgraduates in agriculture should be done in agricultural universities.

(2) Where agricultural colleges are constituent colleges of a university, it should be assisted to develop strong agricultural faculties.

(3) Every agricultural college should have a well-managed farm of at least 200 acres.

(4) Quinquennial inspections of agricultural colleges jointly by ICAR and UGC should be undertaken, and such colleges as do not come up to the requisite standards should be disaffiliated. Some of the colleges may be converted to offer courses at a higher technician level instead of a degree.

14.36-37 (357-358)

170. **Agricultural Polytechnics.** (1) Agricultural polytechnics at post-marticulation level should be organized on a priority basis. These should be attached to agricultural universities and be large institutions with enrolments around 1,000 students. To meet immediate needs, courses may also be added to existing polytechnics located in predominantly rural surroundings.

(2) The polytechnics should be multipurpose institutions providing training for imparting the wide range of skills needed in agriculture and allied fields. While reasonable flexibility should be allowed in their organization, these courses should be distinctly practical in nature. Courses offered should be predominantly terminal in character leading to specific employment, with adequate provision for the exceptionally brilliant students to take up courses in higher education through further study. In course of time, the polytechnics should offer short condensed courses, particularly for the young farmers and also of special interest to girls and women in rural areas.

(3) Attractive scales of pay and adequate qualifications should be prescribed for the staff of these polytechnics. 14.38-43 (358-359)

171. **Agricultural Education in Schools.** (1) Attempts to train for vocational competence in farming through formal schooling in agriculture at primary and lower secondary levels have failed and further efforts should be held in abeyance.

(2) Instead of any narrow vocational training, the school should impart a sound general education with particular emphasis on mathematics and science, as the best preparation for coping with the inevitable rapid changes characterizing our future agriculture.

(3) The proposal for setting up a large number of junior agricultural schools is beset with several difficulties and may fail to serve its objectives. It should be abandoned. 14.44-49 (359-361)

172. **Agricultural Education as Part of General Education.** (1) In all primary schools including those in urban areas, some

orientation to agriculture should form an integral part of general education.

(2) Agriculture should also be made an important part of the work-experience at the school stage.

(3) Undergraduate and postgraduate courses in the colleges and universities should give prominence to orientation to rural and agricultural problems. UGC and other authorities should take suitable steps in this regard.

(4) Similar orientation in agriculture and rural problems should be introduced in all teacher training programmes. 14.50-51 (361)

173. **Extension Programmes.** (1) In raising the professional and technical competence of the VLWs and of the specialists who support them, the agricultural university and polytechnics should render all necessary assistance by making available the specialist staff and by organizing special courses.

(2) When the proposed separation of supply services from the extension work takes place, the extension part of it should be transferred to the agricultural university maintaining, at the same time, closest liaison between the extension work, supply and other programme services of the department of agriculture.

(3) The target should be to set up at least one primary extension centre in every community development block for purposes of extension work, within cycling distance of the area served. It is essential that these centres are manned by staff with a practical knowledge superior to that of the farmers whom they are educating and also that they receive the strongest support and guidance from the extension services of the agricultural university.

(4) Greater use should be made of successful farmers in the carrying out of extension work in education about agriculture generally.

(5) The individual village farmers attending courses at primary extension centres should be encouraged to start Farmers' Study Circles in their villages.

(6) Fullest use should also be made of radio, films and other audio-visual aids in educating farmers and the rural community. 14.52-67 (361-365)

174. **Manpower Needs.** Steps should be taken for preparing more accurate estimates of the requirements of manpower in the agricultural development. In the meantime, vigorous efforts should be made at least to double the output of graduates and to produce an equal number of diploma holders, in the next ten years. 14.68-69 (365-367)

175. **The Role of the ICAR and UGC.** (1) Responsibility for ensuring that agricultural education is launched on the basis of an integrated approach to teaching, research and extension can best be carried out by ICAR.

(2) To enable the ICAR to fulfil its responsibility in this regard, a special Standing Committee of the Council should be set up with a scholar or scientist of national repute at its head.

(3) There should be some overlap in the membership of the UGC and the above Standing Committee and they should evolve common programmes for the development of higher education in agriculture.

14.70-71 (367)

CHAPTER XV: VOCATIONAL, TECHNICAL AND ENGINEERING EDUCATION

176. (1) A concerted and sustained programme is needed to ensure that by 1986, some 20 per cent of all enrolments at the lower secondary level and some 50 per cent beyond Class X are in part-time or full-time vocational and professional courses.

(2) Vocational education courses at school stage should be predominantly terminal in character, with adequate opportunities, for the exceptionally gifted child, to rejoin the main stream and move higher, through further study. 15.09-10 (370-371)

177. **Training Semi-Skilled and Skilled Workers.** (1) There should be a further expansion of facilities in ITIs, beginning by at least a doubling of available places in the fourth plan. The minimum admission age should be gradually lowered to 14, with suitable adjustments in courses.

(2) Junior Technical Schools should be renamed Technical High Schools and along with the existing Technical High Schools should offer courses clearly terminal in character. There should be greater use of available time to meet the requirements of the Apprenticeship Act. Enough flexibility and experimentation should be permitted in the organization of the various courses.

(3) Training in ITIs and technical schools must be production-oriented.

(4) Skilled workers' training courses with entry requirements below Class X should also be attached to polytechnics to make better use of existing facilities.

(5) Facilities for vocational and technical training for school leavers entering employment should be greatly expanded on a part-time, day-release, correspondence, sandwich or short-intensive course basis. Rigidity of approach in the organization of these courses, should be avoided.

15.12-18 (371-372)

178. **Technician Training.** (1) The overall ratio of engineers to technicians should be raised from the present figure of 1:1.4 to 1:2.5 by 1975 and to 1:3 or 4 by 1986.

(2) Courses for the training of technicians should be revised in the light of periodic investigations to be carried out in cooperation with industry, aimed at job analysis and specifications in terms of levels and clusters of skills and responsibilities for technicians.

(3) Diploma training should be more practical, by including industrial experience. This practical training should be of a project or problem-oriented type.

(4) Polytechnics should be located only in industrial areas, while those already functioning in rural areas should develop courses allied to agriculture and agro-industries.

(5) Teachers for polytechnics should be increasingly recruited from industry, by relaxing, if necessary, academic admission requirements. Salaries should not be linked to academic qualifications only.

(6) To give training in as near realistic conditions as possible, vacations should be used by the students and staff to do production work on simple tools either for equipping secondary schools or for sale.

(7) Teaching of science and mathematics in polytechnics should be strengthened, particularly in the first two years. Technician courses should include introduction to industrial psychology and management, costing and estimation.

(8) Polytechnics should increasingly adopt sandwich type of courses in cooperation with industry.

(9) In view of low mobility of diploma holders in the country, the courses offered in polytechnics during the fourth and fifth plans should be designed largely with local requirements in view, keeping at the same time, a watchful eye on total national needs.

(10) Courses of special interest to girls should be offered in all polytechnics at both the certificate and diploma levels and girls completing the lower secondary course should be encouraged to take them up.

(11) Every effort must be made to reduce the present high wastage rates in polytechnics to a minimum and to expand existing polytechnics to their optimum size.

(12) Selected polytechnics should provide post-diploma courses for technicians with some years of experience in industry to qualify as higher level technicians.

15.19-32 (372-375)

179. **Other Vocational Education.** (1) At the higher secondary level (Classes XI & XII), alongside the polytechnics, there is considerable scope for starting a range of interesting courses in commercial, clerical, scientific and industrial trades and in areas of special interest to girls. This should be fully exploited.

(2) Products of Technical High Schools and polytechnics should be encouraged to set up small enterprises of their own or to join together with others in creating small-scale workshops, industries and services needed in the community. 15.33-36 (375-376)

180. **Education of Engineers.** (1) All institutions not conforming to the standards should be improved, converted to institutions training technicians or closed.

(2) For selected branches of engineering such as electronics and instrumentation, recruitment of well-qualified B.Sc. students should be encouraged, with courses suitably adjusted.

(3) Anomalies in the scales of pay between staff members in science and technology faculties in engineering institutions should be removed. An appropriate number of posts in each of these faculties should be reserved for well-qualified persons of the other faculty.

(4) Practical training for full-time degree students should commence from the third year of the course, and should be properly prepared and supervised in cooperation with the industry. Wherever possible, sandwich type of courses should be adopted.

(5) Workshop practice should be more production-oriented.

(6) Courses at both degree and diploma levels should be diversified to meet the changing needs.

(7) For colleges and institutes of technology to become more concerned with the needs of industry, research design projects sponsored either by industry or government should be made a part of the curriculum.

(8) Syllabus should be continually revised in consultation with expert committees, carefully avoiding any rigid conformity.

(9) Development of courses and manpower estimates in new fields such as electronics, instrument technology including automation, chemical technology, aeronautics and astronautics, and nuclear power generation should be carefully planned in advance.

(10) *Teachers.* Teachers should be allowed to undertake consultancy for industry. Widespread summer institutes should be organized.

(11) Suitable salary scales should be offered to make the profession attractive and to ensure that well-qualified engineers may work in teaching and research for significant periods in their careers.

(12) Institutes of technology should undertake large scale teacher training programmes for graduate and postgraduate students. All such courses should include a study of a second modern 'world language' such as Russian or German. The scheme for centres of advanced study should be extended to cover technological field also.

(13) Frequent transfers of teachers and principals in Government colleges for other than professional reasons must be stopped.

(14) *Equipment.* Special consideration should be paid for the timely release of foreign exchange and the stock-piling of essential equipment.

(15) Polytechnics should be discouraged from acquiring sophisticated equipment which is used for only a few days in the year.

(16) Institutions should be encouraged to manufacture proto-type substitutes for imported items of equipment.

(17) *Postgraduate Courses.* Admission requirements to these courses should include at least one year's experience within industry. Rigid uniformity in the organization of these courses is not desirable.

(18) Research at this level should be diverted towards problems of industry. Larger numbers of those taking up postgraduate courses should be sponsored by industry.

(19) A regular doctorate degree for professional development work within industry in addition to a Ph. D. research degree should be created.

(20) Indiscriminate proliferation of courses should be avoided and location of highly specialised courses should be determined at the national level.

(21) The practice of levying capitation fee for awarding seats in engineering colleges should be stopped. 15.37-61 (376-381)

181. **Manpower Requirements.** (1) There is need for rigorous and more refined studies for estimating technical manpower requirements at all levels. Opening of new training facilities and admissions to courses should be linked to such forecasts.

(2) In the immediate future, attention should be given to the elimination of present high wastage rates at all levels and to improvement in quality of instruction offered. Existing facilities should be expanded to their optimum size and part-time courses developed for those already in employment.

(3) Existing marked variations in the socio-economic background of students in technical institutions can be reduced by a greater equalization of educational attainments in secondary schools between urban and rural areas and by adoption of better admission tests. 15.62-64 (381-382)

182. **Medium of Education.** At the secondary and polytechnic stages, the regional language should be the medium of instruction. Its use at higher levels should be related to the position in science faculties. Vigorous action is required for the preparation of good technical textbooks in regional languages. 15.65 (382-383)

183. **Practical Training.** Industrial concerns or Departments selected under the Central Government Practical Training Scheme as also the trainees, should be carefully chosen. The number of training places needs to be increased. If for any reason, the apprenticeship schools started by some public sector undertakings are to be closed down, Central Government should take them over. 15.66-69 (383)

184. **Co-operation with Industry.** A Central scheme of subsidy to industrial concerns providing training facilities should be started. Suitably qualified training officers should be posted to such industry or groups of industries. 15.70 (383-384)

185. **Professional Societies.** Adequate safeguards have to be devised to ensure that requisite standards are maintained by the professional bodies in all the examinations conducted by them. These professional societies should also be associated with the recommended programme of organizing a wide range of part-time technical courses at higher secondary level (Classes XI and XII). 15.71-73(384)

186. **Correspondence Courses.** An immediate beginning should be made to develop a wide range of vocational and technical courses through correspondence. However, before this medium could be adopted extensively, very careful preparation and testing would be required.
15.74-75 (384)

187. **Administration.** (1) A UGC-type organization for technical education with a full-time chairman should be set up with adequate representation for UGC, professional bodies, industry and concerned Ministries.

(2) The Institutes of Technology and comparable institutions should be given full university status, while retaining their individual names and characteristics.

(3) As part of Boards of School Education, Directorates of Technical Education should be set up at the State level, with adequate powers, among other things, for recruitment of staff thus removing a number of procedural delays.

(4) Chairmen of Boards of Governors of Regional Engineering Colleges should be drawn from a panel of distinguished educationists.

(5) Principals of colleges should have, among other powers, full discretion in matters relating to the building up of educational facilities in their institutions within financial ceilings and policy guide-lines.
15.76-86(384-386)

CHAPTER XVI: SCIENCE EDUCATION AND RESEARCH

188. **General Principles.** The progress, welfare and security of the nation depend critically on a rapid, planned and sustained growth in the quality and extent of education and research in science and technology. It is unfortunate that India today is almost at the bottom end of the ladder of GNP per capita, as also of the ladder of per capita expenditure on education and research. In view of the limited resources available, the following measures are needed to make rapid progress:

(1) A rigorously selective approach has to be adopted.

(2) In postgraduate studies and research, the standards of attainment must bear international comparison. The only way this can be done is through a most careful selection of subjects for advanced study and research, selection of the most able students for such courses, and by building a small number of centres of excellence and assigning to each of these, resources exceeding a certain critical size.

(3) In the utilization of our scientific manpower we must strive our utmost to achieve high efficiency—higher even than in the industrially developed countries. We should determine our priorities and programmes in education and research on the basis of hard 'indigenous' thinking and needs, and not follow the fashion set by other countries whether highly 'advanced' or not so advanced.

(4) The development of science must derive its 'nourishment' from our cultural and spiritual heritage and not bypass it.

(5) The need from the earliest stage of science education for a proper understanding of the basic principles and the process of scientific abstraction and creative thinking must be emphasized.
16.01-14(389-396)

189. **Science Education.** (1) Apart from improving the standard of the postgraduate courses, the postgraduate enrolments in science and mathematics need to be expanded several-fold in the coming decades to meet the demands of rapidly expanding secondary and higher education and of research and industry. 16.22(398)

(2) It is necessary to develop a number of Centres of Advanced Study in science and mathematics. Their academic staff should be of the highest quality and should include, wherever possible, some persons of international standing. There should also be a number of visiting professorships on contract appointments for a period of two to three years. The UGC should constitute an all India committee to make offers of such

visiting professorships. Some of the internationally famous Indian scientists at present working abroad as well as distinguished foreign scientists could be invited under this scheme. 16.23(400)

(3) The regional imbalances in the development of science education should be reduced to the minimum. The development of science and technology in a State should be related closely to its potential for economic growth. 16.24 (400-401)

(4) There is an urgent need to revise drastically the undergraduate and postgraduate curriculum in science. 16.25(402)

(5) In our science departments a proper balance between experimental and theoretical aspects should be maintained. Special and urgent attention should be paid to the development of experimental physics and chemistry. In the field of biology, the study of micro-organisms and their role in medicine and agriculture deserves much more attention than is generally the case. Astronomy and astro-physics also need emphasis. 16.26-27 (402)

(6) There should be well-equipped workshops in every college and university department of science. Students should be encouraged to learn the use of workshop tools and get acquainted with some of the essential laboratory techniques and practices. The workshops should work far more intensively than is usually the case. It would be desirable to permit their use by industrial workers enrolled for evening and correspondence courses. 16.28(402)

(7) Students in science subjects should have some knowledge of the theory of errors, basic statistical concepts, and statistical design of experiments. 16.29(403)

(8) Apart from the evaluation of class records and the experiments performed by students, there need be no practical examinations as part of the final examination. 16.29(403)

(9) There is urgent need to introduce an element of flexibility and innovation in the organization of courses for the Master's degree. Combination courses consisting, of, say, one major subject and one subsidiary subject should be provided. 16.30 (403)

(10) It will be a great advantage if major departments in life sciences have on their academic staff a small number of physical scientists (including mathematicians) specially selected for their interest in the study of biological phenomena. 16.31(403)

(11) The need of the day is to bring science and technology closer together in our educational system. 16.31(403)

(12) Apart from the regular two-year M.Sc. courses there is need to provide one-year courses, or of even shorter period, for specialised training in subjects relevant to present scientific, industrial and other needs. These courses could be provided by selected science and technology departments in universities, engineering and agricultural institutions or the National Laboratories. 16.32(403)

(13) It would be desirable for universities and engineering institutions to enrol qualified industrial workers for evening and correspondence courses. Apart from the usual diploma and pass degree courses, special courses to train precision mechanics, laboratory technicians and other skilled operators should be organized. 16.34(404)

(14) There is need for the introduction of a new degree beyond the M.Sc. stage. The course should include with advantage, on an optional basis, elements of pedagogy. 16.35(404)

(15) The programme of the summer science institutes brings together, in active participation, school and college teachers and leading university professors. It is a major instrument in the country's effort towards the improvement of science education. It should be expanded and followed up. 16.37(404)

(16) The IUB and the UGC should take a lead to ensure that, by the end of the fourth plan, most of the books required at the undergraduate level and a considerable number at the postgraduate level are produced in the country. 16.38(404)

(17) We welcome the steps taken for the evolution of a scientific terminology in the Indian languages. It has to be pursued further. It would be an advantage if science students are taught the few Latin roots from which a large number of international terms are derived. 16.39(404-405)

190. **Investment in Research.** In an age characterised by science and technology, research is almost a necessary precondition for all kinds of human endeavour. In the industrially advanced countries the growth of investment in research and development and of manpower engaged in these activities, has surpassed all expectations. The Indian expenditure on R and D is 0.3 per cent of the

GNP; and the total strength of scientists and engineers is only a few hundredths of one per cent of the labour force. The number of qualified scientists and engineers is of the order of a hundred thousand. Our effort in R and D will have to be stepped up. 16.40-44(405-408)

191. **University Research in Science.** A major weakness of Indian education and research is the relatively very small part played by the universities in the sum total of Indian research which itself is far smaller than what it should be in relation to our capabilities and needs. A stage has now been reached when deliberate support and encouragement of advanced study and research in the universities should become a fundamental goal of our national policy. 16.46(408)

(1) The creative scientists and engineers of a country are one of its most precious and scarce assets and should find place in the universities where their 'multiplier effect' is generally maximum: they contribute not only to scientific research but also to the building up of new talent. 16.48(409)

(2) It is important that more and more university people—that is teachers and students—should perform more and more research work and of a better and still better quality. As an ultimate goal, every university researcher should become a teacher and every teacher, a researcher. 16.48 (409)

(3) Publication of qualitative research apart from good teaching ability, should become one of the basic criteria for advancement of teachers in their university career. Gifted students even at the undergraduate stage should be encouraged to participate in some form of research activity. 16.48(409)

(4) Wherever practicable, active scientists in the CSIR, AEC and other research institutions outside the university system should be invited and inducted to participate in teaching and research work, full-time or part-time, for short or long periods. 16.48 (409)

(5) It should be made possible for selected postgraduate students to spend, during their course work, a term or two in another university or institution specializing in the subject of their interest. 16.48(409)

(6) The UGC scheme of assisting teachers, research workers, and laboratory technicians to visit universities and research institutions for short periods (a few weeks to a few months) should be considerably expanded. 16.49 (410)

(7) The development of team-work is an essential condition for the improvement of the quality of university. But it should be real. It should be a part of university research policy to eliminate ruthlessly spurious and parasitic 'team-work'. 16.50(410)

(8) The number of research studies under the supervision of the head of the department or any other teacher should be limited. Research students should also be assigned to younger members of the staff. 16.51 (410)

(9) The qualifications for Ph.D. enrolment need to be upgraded. We should encourage research-minded engineering graduates to go in directly for Ph.D. in mathematics, physics and other science subjects. 16.51 (410)

192. **Mathematics.** It is important that a deliberate effort is made to place India on the 'world map of mathematics' within the next two decades or so. Advanced centres of study in mathematics should be established at three or four universities in the next five to ten years. 16.53 (410)

(1) At least one of the major departments of mathematics in the universities should be encouraged to take an active interest in exploring the possibilities of *programmed learning* in mathematics for upgrading the knowledge and understanding of school and college teachers. 16.54 (410)

(2) One or two special secondary schools for pupils with unusual mathematical ability should be set up in the near future. 16.55 (410-411)

(3) A special effort should be made by the UGC to provide computation installations and training in programming on a selective basis in the universities. By the end of the fourth plan a good proportion of the universities should have basic computer facilities to serve the requirements of study and research in science, mathematics and social sciences. 16.57 (411)

(4) It would be desirable to support energetically and develop one or two active centres for the study of brain and psychosomatic phenomena, using modern techniques and also drawing upon past Indian experience in this field which even today in some ways is of great significance. 16.58 (411)

193. **Equipment.** (1) Measures will have to be found for efficient use of existing equipment and only such equipment as

cannot be produced within the country and whose import is inescapable should be imported.

(2) The UGC and the CSIR should actively encourage and support some of the universities and national laboratories to organize instrument calibration and repair service for the general use of the universities. Training of laboratory technicians should receive high priority.

(3) A special unit should be set up to study and do research in laboratory design.
16.59-61 (411-412)

194. **Administration of Science Departments.** The administration of science departments needs to be radically reorganized, and without delay. If it is to make the fullest use of its resources, it is necessary to associate its staff with administration and decision making in the department.

16.62-64 (412-413)

195. **Pure and Applied Research.** (1) It is wrong to assume that universities should perform almost exclusively pure (basic) research, leaving applied research and development in all branches of science to other institutions. The universities, in the industrialized countries, as shown by the distribution of the national research potential and programme, make a substantial contribution to applied research, and some of them to a small degree even in development research.

(2) Today, with the advance of science and technology, the distinction between pure and applied research—between a research scientist and a research engineer—has become artificial, and in service fields (*e.g.*, electronics) it has almost disappeared. Applied work such as developing important new techniques (new for the country) or designing and fabricating special instruments or apparatus should receive proper recognition, and it should be made possible for such work to earn Ph.D. awards.

(3) Left to itself, there is nearly always a tendency for research (even in project-oriented laboratories) to become 'purer and purer'. This needs to be kept in view in the organization of research in technological institutions. These should place special emphasis on applied and industrial research.

(4) A survey has not yet been made showing how in India the university research potential is distributed along basic, mission-oriented basic, applied and development research. It is essential that this survey be made as soon as possible.
16.65-70 (413-414)

196. **Expenditure on University Research.** (1) University research receives far too small an allocation and if this is not radically corrected, the future of the entire research effort in the country will be in jeopardy. By the end of the decade, something like a quarter of the total university expenditure should be devoted to research.

(2) It would be desirable that in the early stages the UGC makes separate allocations to the universities for support of research.

(3) A related matter of great importance is the provision of adequate foreign exchange.
16.71-74 (414-415)

197. **Basic Research Outside the Universities.** At present there are a number of institutions in the country which devote almost their entire effort on university type of research but function outside the university system. A serious effort should be made to bring them within the universities, or at any rate, to link them intimately with universities.
16.75-76 (415-416)

198. **Brain Drain.** A considerable proportion—we have no precise estimates—of those who go abroad tend to stay indefinitely and a sizeable number accept foreign nationality. The migration is largely to the USA. Not all who go out of India are necessarily first-rate scientists, nor are they of critical importance to the country's requirements. But the problem is of sufficient importance to merit a close and systematic study.

16.77-82 (416-417).

199. **Fellowships for Overseas Training.** Apart from fellowships awarded by foreign agencies, there is a real need for institution by the government of a limited number of research fellowships, say about 100, to be awarded every year for study and research abroad. These fellowships should be awarded to persons of outstanding ability and there should be some form of 'bonding' for them to return to their country.

16.83 (418)

200. **National Science Policy.** (1) It is most important for the governmental authorities at the highest level to ensure that on major scientific issues they can get advice which is as impartial and objective as it possibly can be. For this, it is essential to have an advisory body which should have on it, besides heads of major agencies concerned with scientific research, persons who have a high standing and regard to their profession and who inspire general confidence—a proportion of these members should be distinguished young scientists in their thirties

The number of such persons should not be less than the agency heads. They could be from the universities, research institutions (government or non-government), industry and public life. The advisory body should also have on it not only scientists and technologists but also economists and social scientists and persons with experience of industry and management. The Scientific Advisory Committee to the Cabinet should be reorganized on the above lines and provided with an effective secretariat and with a professional component adequate to its tasks. The Committee should be in a position to assess the broad scientific needs of the country including the universities and advise government on scientific policy and allocation of total resources between different sectors of scientific activities. It should also review continuously the national research policy situation.

(2) Bodies concerned with science policy and implementation and which have executive and managerial functions requiring detailed and expert examination of diverse issues should ordinarily have professional scientists, engineers or science administrators of high standing as their chairmen.

(3) It should be a major task of the national research policy, and policies of the universities to provide a 'climate' conducive to research, and to prevent and eliminate, through energetic and public measures, all dangers and infringements of autonomy and freedom of action in research.

(4) In determining our priorities for research, we should be guided by our own national needs and not be unduly influenced by what may happen to be the current fashion in science. 16.84-93 (418)

201. **Science Academy.** (1) In India the role of a National Academy is performed partly by the National Institute of Sciences. However, it may need some drastic reorganization, if the institute is to exercise a vigorous leadership in science and play a more significant role in the scientific activities of the nation.

(2) India is almost the solitary case of a country which is not represented on the ICSU by a professional Academy but by the Government. This function should be a responsibility of the Academy.

16.94-98 (419-420)

CHAPTER XVII: ADULT EDUCATION

202. **Liquidation of Illiteracy.** (1) Every possible effort should be made to eradicate illiteracy from the country as early as possible and in no part of the country, however backward, should it take more than 20 years. The national percentage of literacy should be raised to 60 by 1971 and to 80 by 1976.

(2) As a first step to arrest the growth of illiteracy, the following measures should be taken:

(a) Expansion of universal schooling of five years' duration to the age-group 6—11;

(b) Provision of part-time education to those children of age-group 11—14 who either miss schooling or drop prematurely out of the school;

(c) Provision of part-time general and vocational education to the younger adults of the age-group 15—30.

(3) For the liquidation of illiteracy a two-fold strategy comprising the selective approach and the mass approach should be adopted.

(4) Under *selective* approach, programmes should be adopted for specified groups of adults which could be easily identified, controlled and motivated for intensive literacy work. All employers in large farms and commercial, industrial, contracting and other concerns should be made responsible, if necessary by law, for making their employees functionally literate within a period of three years of their employment. Big industrial plants in the public sector should take the lead immediately and set the pace in this important direction. Every development project should include, as an integral part, a plan for the education of its employees, more especially of those who are illiterate. Literacy programme should constitute an essential ingredient of all schemes launched by Government for economic and social developments.

(5) Under *mass* approach, all available educated men and women in the country should be mobilized for raising a force to combat illiteracy and utilize it in a well-planned literacy campaign. In the organization of mass campaign, the teachers and students and all educational institutions should be actively involved. The students in the higher primary, secondary, higher secondary, vocational schools and those in the undergraduate classes of the universities and colleges should be required to teach the adults as a part of compulsory national service programme. Teachers in schools of all

types should be required to teach and participate in the campaign. Every educational institution should be given responsibility for liquidating illiteracy in a specified area. The school in particular should be transformed into a centre of community life.

(6) No literacy campaign should be launched without careful planning and preparation. The various measures to be taken for this purpose have been discussed in the Report.

(7) In order to promote literacy among women, condensed courses for women sponsored by the Central Social Welfare Board should be adopted; appointment of 'village sisters' should be encouraged for teaching village women and organizing adult education among local communities.

(8) The mass media of communication should be effectively used as a powerful instrument for creating the climate and imparting knowledge and skills necessary for improving quality of work and standard of life.

(9) In order to retain the literacy achieved, literacy campaigns must have adequate follow-up including further education, the use of library, and the production of reading material. 17.7-31 (423-431)

203. **Continuing Education.** (1) Educational institutions of all types and grades should be encouraged and helped to throw open their doors outside the regular working hours to provide such courses of instruction as they can to those who are desirous of receiving education. A parallel part-time system of education should be created to provide adults with opportunities for taking the same diplomas and degrees as students in schools and colleges.

(2) Educational institutions should give the lead in organizing *ad hoc* courses which will help people to understand and solve their problems and to acquire wider knowledge and experience.

(3) Further education should be provided for workers for improving their knowledge and skills, widening their horizon in life, inculcating in them a sense of responsibility towards their profession and improving their careers. Special part-time and sandwich courses should be offered for them which would lead them step by step to higher courses.

(4) Special institutions such as those run by the Central Social Welfare Board for Adult Women and the Vidyapeeths in Mysore State should be established. The existing institutions should be frequently reviewed in order to enable them to be of service to the rural community.

17.32-43 (431-434).

204. **Correspondence Courses.** (1) In order to bring education to those who are unable even to attend part-time courses, widespread organization of correspondence courses should be organized.

(2) Students taking correspondence courses should be provided opportunities to meet the teachers occasionally; they should be given the status of recognized students, and where possible be attached to some colleges in order to enable them to make use of the library and other facilities.

(3) Correspondence courses should be supported by well-coordinated radio and television programmes.

(4) Correspondence courses should not be confined to preparing students for the university degrees but should also provide agricultural, industrial and other workers such special courses of instruction as would help them to improve production.

(5) Correspondence courses should be made available for those who desire to enrich their lives by studying subjects of cultural and aesthetic value.

(6) Correspondence courses should be developed for the teachers in schools to keep them abreast with new knowledge as well as with new methods and techniques of teaching.

(7) The Ministry of Education in collaboration with other Ministries should establish a National Council of Home Studies, for the purpose of accreditation and evaluation of agencies which provide correspondence courses, identification of the areas in which different types of correspondence courses would be of benefit, promote creation of such courses through proper agencies, and conducting evaluation and research.

(8) Opportunity to take examinations conducted by the Secondary Education Board and Universities in the country should be made available to those who wish to work on their own without any assistance.

17.44-56 (434-436)

205. **The Libraries.** (1) The recommendations of the Advisory Committee on Libraries relating to the establishment of a network of libraries throughout the country should be implemented.

(2) School libraries should be integrated in the system of public libraries and be stocked with reading material of appeal both to children and neo-literates.

(3) The libraries should be dynamic and set out to educate and attract the adults to use them. 17.57-60 (436-437)

206. **Role of Universities.** (1) The Universities in India should assume a much larger responsibility for educating the adults. Some of the important programmes which the University could undertake are described in paragraphs 17.62 and 17.63.

(2) In order to have an efficient machinery for launching carefully planned adult education programmes, each university should establish a Board of Adult Education with representatives from all department involved in adult education programmes. Universities should also set up Departments of Adult Education.

(3) Universities should be financed and equipped for carrying out the adult education work 17.61-66 (437-438)

207. **Organization and Administration.** (1) A National Board of Education on which all relevant Ministries and agencies would be represented should be established. The functions of the Board are stated in paragraph 17.67. Similar bodies should be set up at the State and district levels.

(2) Voluntary agencies working in the field of adult education should be given every encouragement, financial and technical. 17.67-70 (438-439)

CHAPTER XVIII: EDUCATIONAL ADMINISTRATION

208. **Planning.** (1) There has been an overemphasis on achievement of targets in enrolments and expenditure and there is, therefore, a need to take a more comprehensive view and evolve a broader pattern of goals, especially those relating to qualitative improvement.

(2) The general policy so far has been to do something in every sector of every programme with the result that the meagre resources available have been spread thinly over a very large area leading to considerable wastage. It has now become important to concentrate on a few crucial programmes.

(3) In the existing situation where finances are limited, programmes which call for a determined effort, organization, talent and hard work rather than large financial investment, need greater emphasis.

(4) There should be deep involvement of universities, professional organizations, training colleges, etc., in a periodical evaluation of all major programmes included in the Plans and in the development of a large-scale research programme.

(5) The Ministry of Education, in collaboration with the Asian Institute of Educational Planning, should undertake studies of educational planning in the different States and conduct intensive courses for training the personnel involved in the planning process at different levels.

(6) The University Grants Commission should also consider the possibility of setting up an Advanced Centre for Studies in Educational Planning, Administration and Finance.

(7) The process of educational planning in a Federal democracy has to be the right blend of centralization in the appropriate sectors and especially in administration. One useful suggestion which can be made in this context is to adopt a system of priorities at different levels—national, State and local.

(8) School education is predominantly a local-State partnership and higher education is a Centre-State partnership. It is this basic principle that should guide the evolution of the delicate balance between centralization and decentralization which our planning needs. 18.02-08 (443-445)

209. **The Role of Private Enterprise.** (1) The future role of private enterprise in education should be broadly on the following principles:

(a) As most private enterprise has played an important role in the development of education in modern India, the State should make all possible use of the assistance that can come from the private sector for the development of education.

(b) The State has now rightly assumed full responsibility to provide all the needed educational facilities and private enterprise can, therefore, have only a limited and minor role.

18.09-11 (446-447)

210. **The Role of Local Authorities.** The normal practice should be that a local authority gets the right to administer education as a privilege subject to two conditions—good administration and promoting the cause of education— and that this privilege would

be withdrawn if any of these conditions is violated. The future role of local bodies in education may be defined as follows:

(1) As an ultimate objective, it is essential that schools and their local communities should be intimately associated in the educational process.

(2) It would, however, not be proper to press for the universal and immediate adoption of this principle without reference to local conditions.

(3) The immediate goal in this respect—and this should be adopted immediately as a national policy in all the States—is to associate the local communities, namely, village panchayats in rural areas and the municipalities in urban areas, with their local schools and to make them responsible for the provision of all non-teacher costs with the help, where necessary, of a suitable grant-in-aid from the States.

(4) The ultimate goal to be reached is the establishment, at the district level, of a competent local education authority which may be designated as the District School Board and which would be in charge of all education in the district below the university level. This should also be accepted as national policy.

(5) In all association of the local authorities with education, adequate safeguards should be provided to ensure that the teachers are not harassed and that they do not get involved in local factions and politics.

211. **District and Municipal Boards.** (1) The jurisdiction of the District School Board should cover the entire area of the district with one exception, namely, the big municipalities in the district. The Zila Parishad, municipalities, educationists and concerned Departments should be represented on it. A senior officer of the State Government should be the whole-time secretary of this Board, which should be provided with the necessary administrative and supervisory staff.

(2) The functions of this Board would cover all school education in the district—general as well as vocational. It will directly administer all government and local authority schools within the district, and it will also remain in charge of giving grants-in-aid to all private institutions in the district in accordance with the rules framed by the State Government for the purpose.

(3) It should be a responsibility of the Board to prepare plans for the development of school education within the District and it should also be the principal agency within the district to develop school education, the finances and guidance required for the purpose being provided by the State Government and the State Education Department.

(4) In big towns with a population of one lakh or more, it would be desirable to establish Municipal School Boards on the above lines since these would be viable administrative units. The composition, powers and responsiblities of these Boards should be similar to those of the district school boards.

(5) Each school board will maintain an education fund. The Zila Parishads (or Municipalities) will approve the budget of the school boards. They will also raise the resources expected of them and credit them to the School Board. In all day-to-day administration, the School Board would be autonomous. The same relation would hold good between a Municipal School Board and its Municipality.

(6) Recruitments and transfers will be done by a special committee consisting of the Chairman of the Board, its Secretary and the District Education Officer, subject to rules framed by the State Government, the general policy being to reduce transfers to the minimum and to allow teachers to develop loyalties to individual institutions.

(7) It may be better in some cases not to burden the school boards with full administrative responsibility all at once. Powers may be conferred on a board as it becomes experienced and shows its capacity to exercise them.

18.12-24 (447-451)

212. **The Role of the Central Government.** (1) Besides institutions in the scientific and technical sector, it is also necessary for the Centre to establish institutions specializing in social sciences including pedagogical sciences and the humanities. These should be established in close association with the universities and be an integral part of the university system.

(2) The Centre can also develop education in the Union Territories, particularly in Delhi, to serve as a pace-setter for the other areas.

(3) The Centre should scout for talent in different fields and make the services of the best people in the country available to the State Governments for advice and assistance in all matters.

(4) Funds for specific special programmes in the educational sector within the State Plans may not be earmarked. The total allocation for education, however, should not be altered without the approval of the Planning Commission. But within it, the State Governments should be free to use funds at their discretion.

(5) Considerable importance should be attached to the expansion of the Central and the Centrally-sponsored sector. It is through this mechanism that the Centre will be able to stimulate and guide educational developments in the national interest in crucial sectors.

(6) Education should not be fragmented keeping one part in the concurrent and the other in the State list. In a vast country like ours the position given to education in the Constitution is probably the best because it provides for a Central leadership of a stimulating but non-coercive character. The greatest need is for elasticity and freedom to experiment.

(7) An intensive effort should be made to exploit fully the existng provisions of the Constitution for the development of education and evaluation of a national educational policy. The problem may then be reviewed again after ten years.

18.25-30 (451-453)

213. **Ministry of Education.** (1) The present practice of giving the post of Secretary to the Government of India to an eminent educationist, who is designated as Educational Adviser to the Government of India and Secretary to the Ministry of Education should continue. This should be a selection post and the selection should be made from amongst all persons available, official, non-official, IES, university men, etc. It should also be a tenure post given only for six years in the first instance, with an extension in exceptional cases for three or four years but not renewable further.

(2) About half the posts of additional or joint secretaries should be filled by promotion from officers seconded from the State Education Departments and the remaining half should be filled from eminent educationists and outstanding teachers in universities and schools. The term of each tenure should be five years to be renewable at the most for a second term.

(3) The clearing house function of the Ministry of Education needs considerable strengthening and expansion. A well-staffed Division should be created to perform this function on an adequate scale.

(4) The Ministry of Education may set up a committee to examine the various types of studies required and to prepare a programme for action.

(5) It is a major responsibility of the Ministry of Education to maintain a good statistical service for educational planning, policy making and evaluation. In order that this function may be discharged properly, the Statistical Section of the Ministry should be reorganized and strengthened along the lines recommended. The statistical units of the State Departments of Education will have to be reorganized and strengthened likewise.

(6) The Central Advisory Board of Education with its standing committees should be functionally strengthened.

18.31-35 (453-455)

214. **National Council of Educational Research and Training.** (1) The NCERT should be developed as the principal technical agency functioning at the national level for the improvement of school education and operating through and in collaboration with the National Board of School Education, State Departments of Education and their technical agencies like the State Institutes of Education.

(2) The governing body of the NCERT should have an all-India character with a majority of non-officials. It is desirable to have at least one outstanding teacher from secondary schools and a person specialising in primary education, preferably a primary teacher.

(3) The Council should have its own full-time Director and Joint Director. The Director should be an eminent educationist in the field and his status should be that of a vice-chancellor. His term of office should

be five years, renewable for not more than one term. The Joint Director would be needed mainly for the purpose of assisting the Director and relieving him of routine administrative matters.

(4) The Central Institution of Education, under the NCERT, should be transferred to the Delhi University.

(5) It is desirable that there should be considerable interchange and flow of officers from the NCERT to the State Education Departments and vice versa.

(6) The campus of the NCERT should be developed speedily and the building programme given the highest priority.

18.36 (455-456)

215. **Educational Administration at the State Level.** (1) It is desirable to create, at the State level, some machinery to coordinate educational programmes which are spread over a number of departments and take a unified view for purposes of planning and development.

(2) A statutory Council of Education should be created at the State level with the State Minister for Education as the Chairman. Its membership should include representatives of universities in the State, all Directors in charge of different sectors of education and some eminent educationists. Its principal functions would be to advise the State Government on all matters relating to school education, to review educational developments in the State and to conduct evaluation of programmes from time to time through suitable agencies. Its annual report along with its recommendations should be presented to the State legislature.

(3) A standing committee at the officers' level which would include all State level officers in charge of different sectors of education should meet periodically under the chairmanship of the Education Secretary.

(4) The Education Secretary also, like the Educational Adviser to the Government of India, should be an educationist rather than an administrative officer. It will be desirable to make this appointment a tenure post.

(5) Broadly speaking, the role of the Education Secretariat should be to examine educational problems from the administrative and financial point of view and in the wider context of governmental policies for development. It should give due weightage to the views of the Directorate in technical matters and assist the Director to function as the effective head of the Department.

18.37-42 (456-457)

216. **Indian Educational Service.** (1) The Indian Educational Service should be a service agency to teaching and research and should consist of persons who have teaching experience with the possibility of the educational administrator returning to teaching and the teacher going over to administration at least on a tenure assignment. Its method of recruitment should be a follows:

(a) Only one-third of the posts should be filled by direct recruitment at the level of the junior scale. Even these selected persons should not be placed in administration direct. Their first assignments for a minimum period of 2-3 years should be in teaching and it is only after this initiation that they should be assigned to administration.

(b) The remaining two-thirds of the posts should be filled partly by direct recruitment and partly by promotion at the level of the senior and higher scales.

(c) Some posts of the IES should be available for being filled by tenure appointments of teachers for specified periods. In the same way, some posts in teaching and research should also be available for tenure appointments of persons from the IES.

(2) As there are insuperable difficulties, the idea of creating a teaching wing in the IES should be abandoned. The service should encadre only the posts of Directors and officers of the Directorate, District Educational Officers and headmasters of higher secondary schools in the State, and at the Centre, educational officers of the Ministry of Education and other Ministries and Education Departments of Union Territories.

(3) An adequate number of posts comparable to the higher scales of pay in the IES should be created in the universities and colleges to prevent a drain of talent from teaching and research to administration.

(4) It should be a convention that only about 50 per cent of the IES officers are assigned to their own States and there should

also be a possibility of inter-State transfers (in addition to deputation to the Centre). To facilitate this. Each member of the IES should be required to study and pass, within a given time after recruitment, tests in two other languages (Hindi and one more Indian language which is not his mother-tongue) to certain prescribed depth.

18.44-49 (458-459)

217. **State Educational Service.** (1) There should be an adequate number of posts at higher levels, namely, in Class I and Class II. The Secretaries of the District School Boards should be in Class I. The District Educational Inspectors (who will be in the IES) should have adequate assistance from officers of Class I and Class II status. In order to attract talented persons, recruitment is needed at three levels: Assistant Teachers' level; Class II level (50 per cent for freshers and 50 per cent for promotion) and Class I level (75 per cent for freshers and 25 per cent for promotion).

(2) A major reform now needed is to reorganize the State Education Departments where necessary on the basis of specialized functionaries and what is even more urgent and important is to make adequate arrangements for their specialized training with the help of the universities.

(3) To reduce anomalies in the salaries of the departmental staff and enable transferability, it is proposed that (a) the scales of pay in the teaching and the administrative wings should be identical and (b) the scales of pay of the departmental staff should be correlated with the UGC scales of pay for university teachers. 18.50(459-460)

218. **Training of Educational Administrators.** (1) The State Institutes of Education, in collaboration with universities where necessary, should organize the in-service educational programmes of all the non-gazetted staff on the administrative and inspectional side. In addition, they should also organize conferences, seminars and workshops for the gazetted staff.

(2) The old practice of giving furlough leave to administrators for undertaking special studies in educational problems should be revised.

(3) Some incentives should be provided for the officers who improve their qualifications materially through programmes of in-service education. 18.51-52(460-461)

219. **National Staff College for Educational Administrators.** The Ministry of Education should establish a National Staff College for Educational Administrators. It should provide in-service education for all the senior officers in the Educational Services—IES and State Educational Services. It should conduct two types of courses a longish induction course for new recruits and shorter courses of three to six weeks for officers in service. It should have a research wing for conducting studies in problems of educational administration and function as a clearing house of administrative procedures and practices in the States and Union Territories. It should also conduct periodical conferences, seminars and workshops on matters relating to educational administration.

18.53(461-462)

220. **Education Departments.** The present position in most States is that the Education Departments are under-staffed because the growth of the departmental staff does not precede but follows the growth in the number of educational institutions; the norms fixing the number of officers required are not, even if fixed, observed in practice; the expenditure for increasing the departmental staff always has a low priority. The reversal of these policies is necessary subject to one reservation, *viz.*, it is better to have a fewer officers at a higher level and on adequate scales of pay than a large number of officers at the lower level. 18.54(462)

221. **Procedures.** (1) There should be a change in the attitudes of administrators who should cultivate an openness of mind and a spirit of enquiry rather than a rule-of-the-thumb approach which tries to stick to established practices even when they cease to be meaningful.

(2) The practice of holding periodical reviews, say, every three or five years, of important administrative practices with a view to chopping off dead wood and putting in fresh grafts where necessary should be established.

(3) Inter-State contacts should be built up and comparative studies in different State practices in all administrative matters should be encouraged. Periodical comparative studies in educational administration which would involve the State Education Departments closely should be made.

(4) The evolution of the technique of detailed programming of the plan projects and the training of officers in them is the responsibility of the State Institutes of Education and the National Staff College for Educational Administrators.

(5) The modern 'officer-oriented' system where most of the work will be done by the officers at their own level with the help of a small secretariat staff should be adopted.

18.55-56 (462-463)

222. **Education Acts.** (1) Education should be given a statutory basis everywhere and in all sectors and Education Acts should be passed in all the States and Union Territories. These should be comprehensive and consolidated measures which will replace all the miscellaneous laws which now exist and which will also provide a statutory basis for certain important aspects of administration (*e.g.*, grant-in-aid code) which now exists merely in the form of executive orders.

(2) The Government of India should issue a statement on the national policy in education which should provide guidance to the State Governments and the local authorities in preparing and implementing educational plans in their areas.

(3) The possibility of passing a National Education Act may also be examined.

18.57-58 (463)

CHAPTER XIX: EDUCATIONAL FINANCE

223. **Total Expenditure on Education.** If education is to develop adequately, educational expenditure in the next 20 years should rise from Rs. 12 per capita in 1965-66 to Rs. 54 in 1985-86 (at constant prices). This implies that the educational expenditure, which increased from Rs. 1,144 millions in 1950-51 to Rs. 6,000 millions in 1965-66, will further rise to Rs. 40,364 millions in 1985-86 and that the proportion of GNP allocated to education will rise from 2.9 per cent in 1965-66 to 6.0 per cent in 1985-86. 19.21-24 (473-474)

224. **Allocation of Funds.** While the broad pattern of educational expenditure in the different sectors of education during the next two or three decades will be to devote two-thirds of the available resources to school education and one-third to higher education, the relative emphasis on programmes should change from decade to decade as follows:

(1) From 1965 to 1975, the relative emphasis should be on a larger expenditure at the school stage. This will be necessary in order (i) to upgrade the salaries of school teachers; (ii) to transfer the PUC and the Intermediate classes from the university to the school stage; (iii) to provide at least five years of effective education to all children; and (iv) to vocationalize secondary education.

(2) The programmes to be emphasized during the decade 1975 to 1985 will include the provision of seven years of effective primary education, the addition of one year to the school stage and vocationalization of secondary education. During this decade, emphasis should begin to shift in favour of higher education.

(3) After 1985, there will be increased emphasis on the development of higher education and research. 19.25 (474-476)

225. **Sources of Educational Finance.** (1) Although most of the responsibility for the support of education will be placed on governmental funds, a total centralization of all financial responsibility for education in the Government will not be desirable. Attempt should, therefore, be made to raise contributions from local communities, voluntary organizations and the local authorities for this purpose.

(2) The assistance of the local community should be mobilized through the organization of school improvement conferences for improving the physical facilities in schools and the creation of school funds.

(3) In order to provide financial support to District School Boards, the Zila Parishads should raise funds for education by levying cess on land revenue. The State should prescribe the minimum rate of the levy and authorize the Zila Parishads to raise it to a certain prescribed maximum. In order to stimulate the collection of funds, the Government should give grant-in-aid proportionate to the additional revenues thus collected by the Zila Parishad.

19.14-20 (471-473)

226. **Grant-in-aid to Zila Parishads.** (1) The system of grant-in-aid from the State Government to Zila Parishads should be reformed on the following lines:

(a) 100 per cent grant for salaries and allowances of teachers and other administrative and supervisory staff sanctioned by the Government. Definite norms regarding the number of teachers required and the administrative and supervisory staff needed should be fixed.

(b) For non-teacher costs, a block grant per child in attendance should be given. The amount of this grant should be fixed separately for each category of schools and should be revised after every 3 to 5 years.

(c) The resources raised locally by a Zila Parishad as well as the State grant thereon should be left with the Zila Parishad for such developmental programmes as it deems necessary; and

(d) Grant-in-aid for non-recurring expenditure should be given separately, preferably at about two-thirds of the expenditure.

(2) The amount of grant-in-aid given by the State Government to Zila Parishads should be allowed to be funded and not made to lapse at the end of the financial year. (Para 2, Supplementary Note I, p. 491)

227. **Grant-in-Aid to Municipalities:** (1) It should be made obligatory for the Municipalities to bear a certain proportion of the cost of education. For this purpose, they should levy a cess on lands and buildings.

(2) For the purpose of Government grants, the Municipalities should be classified into groups on the basis of their wealth and the poorer Municipalities should be given grant-in-aid at a higher rate than others.

(3) All Corporations should be made responsible for supporting at least primary education within their jurisdiction. The Government grant to them should be on a proportional basis so that the Corporations contribute a certain percentage of the expenditure from their own funds.

(Para 4, Supplementary Note I, pp. 491-492)

228. **The Role of the Centre.** The Central Government should assume a larger financial responsibility for education by expanding the Central and Centrally sponsored sectors. It should have the following characteristics:

(1) It should include programmes of crucial importance and national in character.

(2) In the Centrally sponsored sector, it should be possible for some programmes to vary from State to State according to their needs.

(3) Central assistance for programmes in the Centrally sponsored sector should be given for five years which may in certain cases be continued up to 10 years and not for plan periods only as at present.

(Paras 9—15, Supplementary Note I, pp. 493-496)

229. **Economies and Utilization.** Even with the mobilization of maximum resources for education, the funds will still be inadequate to meet even the minimum needs of educational reconstruction, if conventional techniques involving large wastage and stagnation continue. It would, therefore, be necessary to adopt measures for economy, for eradication of wastage and for most efficient utilization of funds. Some of these measures have been indicated in paragraph 20.44. These and all other measures, which promote economy consistent with efficiency, should be adopted. 19.41 (486-487).

230. **Research.** Studies conducted in some other countries indicate the importance of education for economic growth, but no such studies have been conducted in India so far. In view of the importance of the subject, the UGC should encourage studies on the subject to be conducted in a few universities.

19.43 (487)

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